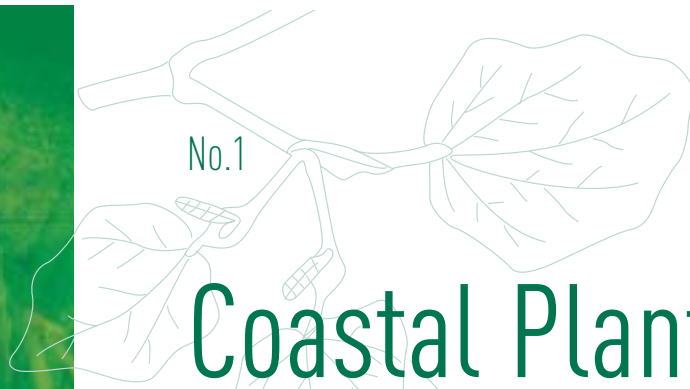


coastal planting guide 1



Coastal Planting Guide

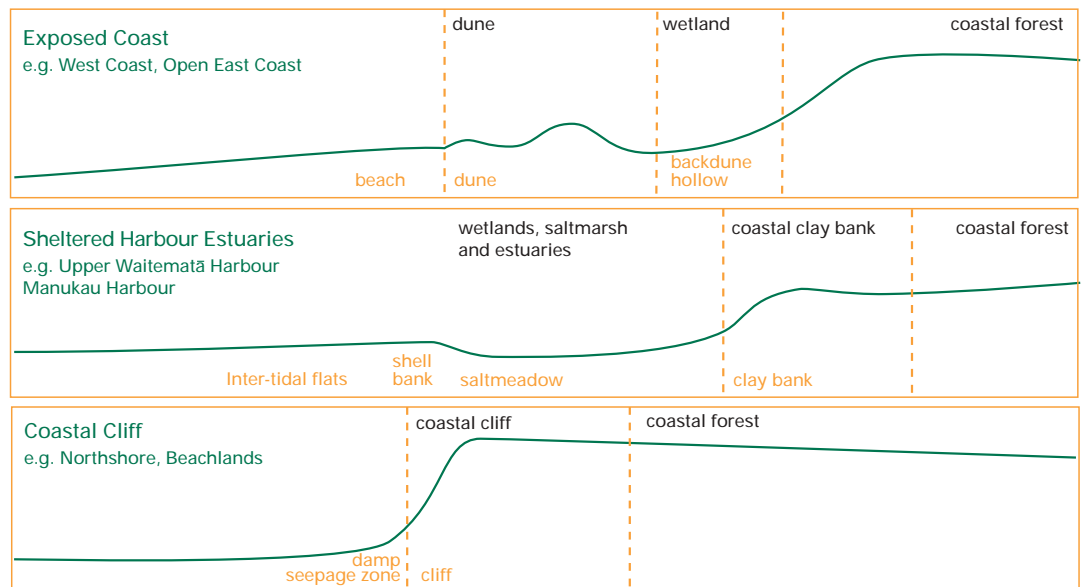
The coasts of New Zealand were formerly clothed in native vegetation. The plant communities would have graded from highly salt tolerant species typical of estuaries, dunes and rocky cliffs to hardy ferns, herbs, shrubs and trees, typical of coastal broadleaf forests.

The land margin bordering the sea represents a unique and sensitive environment and the vegetation in this zone has several important functions. Good vegetation cover can help to protect coastal soil and sand from being eroded by wind and water action. The natural character of the coastal environment can be preserved through the maintenance and restoration of native plant communities found in these zones. Stands of native vegetation between the beach and adjacent human development provides an important buffer, screening buildings and providing habitat for native birds and animals.

This factsheet is the first in a series of coastal planting guidelines, which have been produced to address the many reasons for planting in coastal locations, and to provide guidance as to what species are appropriate in different coastal zones. The choice of plants for coastal areas is limited in exposed sites, but is progressively wider for more sheltered zones inland. This information provides a coastal supplement to the ARC Riparian Zone Management Strategy, Guideline and Planting Guide (2001), which focuses on freshwater environments.

This factsheet contains general information about coastal planting including site preparation, sourcing plants and maintenance of your coastal planting. The other five factsheets in the series provide detailed planting guides for specific coastal areas. These have been prepared for the following environments:

- 2 Dunes
- 3 Coastal forests
- 4 Coastal cliff tops
- 5 Coastal wetlands, saltmarshes and estuaries
- 6 Coastal clay banks



The above diagrams illustrate the location of these environments within the coastal landscape.

Go Native!

Naturally occurring coastal plants have adapted to this harsh environment by developing strategies such as fleshy leaves to conserve moisture, tough leathery leaves to withstand salty wind and by having a growth form which keeps foliage and flowers out of the wind.

Why Plant?

- To **improve biodiversity** by restoring threatened ecosystem types and habitats, by increasing the diversity of native coastal plant and animal species and enhancing remnant vegetation. Many native birds, reptiles and invertebrates live in the coastal zone or use them as a travel corridor. Larger areas of vegetation support more species and enhance the long term viability of ecosystems.
- To help reduce erosion and **improve soil stability** by dewatering soil and increasing soil binding root mass. Vegetation buffers are less expensive than engineered erosion management options. Some native plants are better designed to stabilise foredunes, and other native coastal species are more appropriate in backdune areas, coastal forests, banks and cliffs.
- To improve scenic values and to enhance or **restore natural character** of the coastline through the use of native plants found naturally in these zones.
- Dense stands of native species can shade out introduced weeds.
- To define **public access** ways for pedestrians from the land down to the beach, and to prevent people reaching cliff edges.
- To enhance desirable views and to **create native gardens** in coastal zones. It is important to take into account the size mature plants will grow to if you seek to preserve **coastal views** from properties.
- To provide **shade and shelter**.

Coastal Gardening

Many of us live on or near the coast, and gardens are commonly established in coastal areas with harsh environmental conditions, where plants must cope with salt laden winds and drought. Our gardens can have a huge impact on natural ecosystems and plants and garden layouts should harmonise with the coastal environment. Landscaping with lawns increases the potential for storm damage and erosion. Historical use of exotic species in coastal gardens (such as coastal banksia, agapanthus, pampas and boneseed) has led to these garden escapees becoming established in the coastal environment, where they can spread quickly and smother native plants.

The sea has a moderating effect on climate and many species, which are frost tender, may be able to be grown in a coastal garden, if sheltered from the wind. There are many native coastal species that are appropriate for coastal gardens.

Did you know?

Native coastal vegetation and dunes are some of New Zealand's most threatened ecosystems. The coastal forests, beaches and dune systems of northern New Zealand and the Auckland region are part of our unique national identity and biodiversity. Coastal forests have been reduced by over 90% from their original extent. Less than 10% of New Zealand's sand dunes are unmodified.

Eco-sourcing

It is important that ecologically appropriate species are planted, and where practicable, to obtain plants that have been obtained from local sources (i.e. eco-sourced). These plants are better adapted to the local climate than plants of the same species obtained from an inland source or a coastline that is exposed to different climatic conditions. For example, plants of the same species, such as pingao, that are suited to growing on the relatively sheltered east coast, may not be able to withstand the harsh conditions of Auckland's west coast.

You may be able to grow some of your plants from seeds or cuttings taken from existing plants on the adjacent coastline – always seek permission before taking any plant material. Buy plants from nurseries that source plants from your district to ensure they are suited to your area's climate and soils. Avoid using unnatural cultivars of native plants such as variegated flax and pohutukawa, which are not well adapted to the coastal environment, and may weaken local populations.

Planning before you start ...

Carefully check the proposed planting site for signs of early human occupation (e.g. midden, pa defences). Permission is required from the New Zealand Historic Places Trust before disturbing any archaeological sites, e.g. planting into midden. Contact the ARC and talk to one of the archaeologists if more information is needed.

Prepare the site before planting. Remove existing weeds. It may be appropriate to retain some exotic species in the short term if they are helping to control erosion or if they will shelter, but not smother, young native plants.

Ensure that your coastal planting and existing natural areas are adequately fenced to protect them from stock and people. Avoid over-grazing, stock treading or wallowing which will destabilise vegetation and may erode farm land. Encourage natural regeneration by keeping stock out of natural areas such as estuaries and mangroves.

Time planting to occur in the **planting season** from March to June to avoid drought. This encourages the root system to become well established before the soil dries out the following summer.

Select a mixture of canopy and shrub layer plants with higher numbers of colonising species to establish shelter. Introduce other species later to enhance the overall plant diversity.

To aid the survival of plants in the coastal zone, use reasonably large **size** potted stock in either PB3 or PB5 planter bags, or budget for replacement planting.

Soak the plant thoroughly before planting. Plant with the root ball just below the soil surface (with the exception of foredune plants) and ensure plants are well **watered** at the time of planting and as required thereafter.

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 pohutukawa need to be planted more than 5m apart. Set plants out in groups and plant closely to each other to provide sheltered environments. Some species are more suited to being planted in open areas to establish nurse crops for other native species.

If your budget allows, incorporate a 12 month slow release **fertiliser** (such as 'grow tabs') into the hole when planting to give plants a boost.

Consider erecting some form of temporary **shelter** to reduce plant damage from salt laden wind. Temporary shelters made from shade cloth are useful but expensive, and will require ongoing maintenance. Take advantage of shelter provided by existing plants.



Coastal Species

This is a general list of native coastal species for the Auckland region. For more information on appropriate coastal plants for specific coastal zones refer to Coastal Planting Guides 2-6. It is important that **ecologically appropriate** species are planted, and where practicable, to obtain plants that have been grown from local sources (ie 'eco-sourced'), so they are able to cope with local environmental conditions.

Plants marked with * are colonising plants suitable for planting in open situations, where existing vegetation is lacking or has been removed to clear pest plants from the site. Other species in this list are more suitable for interplanting in existing vegetation, or after the initial colonisers have become established and have begun to provide some shade and shelter.

| Māori name/ Common name | Botanical Name | Life Form | Height | Comments | Coastal Area |
|--------------------------------|--|------------------------|--------|---|---|
| | <i>Baumea juncea</i> | sedge | 1m | Found in lowland coastal swamps and saltmarsh areas. | Saltmarsh. |
| | <i>Carex testacea</i> | sedge | 0.3m | Orange grass found in backdune. Attractive plant for coastal gardens. | Backdune. |
| | <i>Coprosma rhamnoides</i> | shrub | 3m | Small leaved divaricating shrub. | Coastal forest. |
| akeake | <i>Dodonea viscosa</i> | small tree | 10m | Hardy. Attractive pale green seed (summer). Requires shelter from salt laden winds. | Backdune. |
| akepiro | <i>Olearia furfuracea</i> | small tree | 7m | Exposure tolerant. Daisy like flowers in summer. | Coastal forests, clay banks and coastal cliffs. |
| bachelor's button | <i>Cotula coronopifolia</i> | herb | 0.2m | Creeping herb. Grows well in wet hollows, banks, estuaries, ditches and swamp margins. Will establish naturally. | Clay banks, coastal cliffs and estuaries. |
| cliff hebe | <i>Hebe obtusata</i> | small shrub | 0.3m | Plant in Waitakere only. Frost tender. Mauve flower (summer-winter) | Coastal cliffs and clay banks. |
| coastal tree daisy | <i>Olearia solandri</i> | shrub | 3-4m | Erect shrub with tiny leaves. Quick growing. Does well on estuarine edges. Abundant fragrant flowers (autumn). | Saltmarsh/ estuaries. |
| giant umbrella sedge | <i>Cyperus ustulatus</i> | sedge | 0.8m | Good in damp areas and freshwater seepages. Forms large dense clumps. | Saltmarsh/wetlands /estuaries, and back-dune hollows. |
| hangehange | <i>Geniostoma rupestre</i> var. <i>ligustrifolium</i> | shrub or small tree | 4m | Lowland shrub with light green foliage. Needs protection from wind when young. Useful understorey species. | Clay banks, coastal cliffs, coastal forest. |
| harakeke/flax | <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 flowerheads. Attracts birds. Good all-rounder. | Clay banks and coastal cliffs, backdunes, saltmarsh/ wetlands/estuaries. |
| hinarepe/ sand tussock | <i>Austrofestuca littoralis</i> | tussock | 0.5m | Not common in Auckland region. Isolated areas on Great Barrier Island and at Pakiri. Threatened plant. | Dunes. |
| horokaka/ NZ iceplant | <i>Disphyma australe</i> | ground- cover | 0.1m | Fleshy-leaved ground cover with white-mauve flowers (summer). Plant at the rear of high tide and at the base of a clay bank. | Dunes, clay banks, coastal rocks. |
| houpara/coastal five finger | <i>Pseudopanax lessonii</i> | small tree | 7m | Good colonising plant. Grows to a large tree. Glossy leathery leaves. Responds well to pruning. Very hardy. | Clay banks, coastal cliffs, backdune, coastal forest. |

| Māori name/ Common name | Botanical Name | Life Form | Height | Comments | Coastal Area |
|------------------------------------|---|------------------------|--------|---|--|
| kānuka | <i>Kunzea ericoides</i> | tree | 16m | Good colonising species. White flowers (spring-summer). | Coastal forest, clay banks and coastal cliffs. |
| kāpūngāwhā/ lake clubrush | <i>Schoenoplectus tabernaemontani</i> | tall rush | 1-2m | Grows at the interface between saltmarsh and fresh water. | Saltmarsh, wetlands and estuaries. |
| karaka | <i>Corynocarpus laevigatus</i> | tree | 18m | Hardy, leafy canopy tree. Produces large numbers of bright yellowish orange fruit. | Coastal forest and clay banks. |
| karamū | <i>Coprosma robusta</i> or <i>C. macrocarpa</i> | shrub or small tree | 5m | Hardy shrub with abundant orange berries in late summer-autumn. Moderate salt tolerance. Attracts birds. | Coastal forest, clay banks and coastal cliffs. |
| kārō | <i>Pittosporum crassifolium</i> | small tree | 10m | Common vigorous coastal shrub or tree with grey-green foliage and dark red flowers that are scented at night. Tolerates strong wind, salt and poor soil. Flowers attract birds. | Backdunes, clay banks, coastal cliffs, coastal forest. |
| kawakawa | <i>Macropiper excelsum</i> | small tree | 7m | Large heart shaped leaves, usually holed by chewing native moth. Orange fruits in summer attract birds. Self-seeds easily. May need some shelter to establish. | Coastal forest, clay banks and coastal cliffs. |
| kohekohe | <i>Dysoxylum spectabile</i> | large tree | 17m | Needs shelter and is frost tender. Flowers and fruit attracts birds. | Coastal forest, clay banks, coastal cliffs. |
| korokio | <i>Corokia cotoneaster</i> | shrub | 3m | Interlacing shrub with dark bark. Often used for hedging. | Coastal forest. |
| koromiko | <i>Hebe stricta</i> or <i>H. macrocarpa</i> | shrub | 4m | Coloniser. Long, white flower spikes in spring. | Coastal forest. |
| kōwhai | <i>Sophora microphylla</i> or <i>S. chathamica</i> | tree | 10m | Wind hardy and drought tolerant. Attracts birds. <i>Sophora fulvida</i> should be planted on Waitakere west coast only. | Coastal forest. |
| kōwhangatarā/ spinifex | <i>Spinifex sericeus</i> | grass | 0.5m | Silver sand binding grass, sends long runners down foredune. | Dunes. |
| kōwharawhara/ coastal astelia | <i>Astelia banksii</i> | herb | 1-2m | Grows on rocks or as an epiphyte often on pohutukawa. Long drooping leaves of silver-green colour. Greenish flowers followed by purple fruit. Plant on dry slopes. | Coastal cliffs, coastal forest. |
| kukaraho/puruā/ marsh clubrush | <i>Bolboschoenus fluviatilis</i> | sedge | 1-2m | Margins of streams, swamps. Brackish water. Fast growing. Stems die back over winter. | Saltmarsh/wetlands estuaries and back dune hollows. |
| māakoako/ sea primrose | <i>Samolus repens</i> | ground -cover | 0.1m | Found mainly in salt marshes. Also grows on banks and cliffs. Establishes naturally. | Saltmarsh, clay banks and coastal cliffs. |
| māhoe | <i>Melicytus ramiflorus</i> | tree | 10m | Fast growing tree. Good for damp shady sites. Very hardy. | Coastal forest. |
| mākaka/ saltmarsh ribbonwood | <i>Plagianthus divaricatus</i> | shrub | 3m | Can be grown in salt marshes and along estuaries. Also grows in dune hollows and coastal gravels. Bushy, useful as hedging. | Saltmarsh edges, estuaries and wetlands. |
| mānawa/ mangrove | <i>Avicennia australis</i> var. <i>resinifera</i> | tree | 8m | Desirable in terms of local ecology as they provide bird and fish habitat, reduce sedimentation in the wider estuary and are an important source of organic material to the estuarine food chain. Will establish naturally. | Saltmarsh and estuaries. |

| Māori name/ Common name | Botanical Name | Life Form | Height | Comments | Coastal Area |
|-----------------------------|-------------------------------|---------------|----------|--|--|
| mangeao | <i>Litsea calicaris</i> | tree | 15m | May be hard to establish but grows into an attractive tree. | Coastal forest. |
| mākaka/ NZ broom | <i>Carmichaelia australis</i> | small tree | 10m | Small bush with lavender flowers. | Coastal forest, clay banks, cliff tops. |
| mānuka/ tea tree | <i>Leptospermum scoparium</i> | small tree | 8m | Grows vigorously and has a wide ecological tolerance. Important pioneer species. Forms well developed root system that stabilises banks. White flowers. Avoid disturbing roots when planting. | Clay banks, coastal cliffs, coastal forest, saltmarsh/ estuarine fringe. |
| māpou | <i>Myrsine australis</i> | tree | 7m | Slender tree with red stems. Hardy. Attracts birds. | Clay banks and coastal cliffs. |
| needle grass | <i>Austrostipa stipoides</i> | grass | 1m | Sharp-tipped tussock. | Saltmarsh, mudflats and rocks. |
| nihinihi/ shore bindweed | <i>Calystegia soldanella</i> | ground -cover | 0.2m | Pink flower, grows on foredunes, shingle and backdunes. Also a ground cover for coastal gardens. Establishes naturally. | Foredune and backdune. |
| nīkau | <i>Rhopalostylis sapida</i> | palm | 10m | Slow growing. Red berries provide food for kereru/native pigeon. | Coastal forest. |
| ngaio | <i>Myoporum laetum</i> | tree | 8m | Very wind hardy, grows well in sandy soil. Fleshy gland dotted leaves. Good shelter tree. Frost tender. | Backdune, cliffs and clay banks. |
| NZ spinach | <i>Tetragonia implexicoma</i> | ground -cover | 0.1m | Grows on coastal rocks. Fleshy leaved groundcover covered in red fruits. | Coastal cliffs. |
| oioi/jointed wire rush | <i>Apodasmia similis</i> | rush | 1m | Base of cliffs and clay banks, in seepage areas. Bordering salt marshes and estuaries. | Backdune, base of coastal cliffs, clay banks, saltmarsh and estuaries. |
| pīngao/golden sand sedge | <i>Desmoschoenus spiralis</i> | sedge | 0.5-1.0m | Grows on naturally moving sand dunes. Will grow in a garden with good drainage. Golden leaved. Also used for weaving. Threatened plant. | Foredune. |
| pōhuehue/ wire vine | <i>Muehlenbeckia complexa</i> | vine | 1m | Hardy, ideal for banks and other difficult sites. Also grows well on a trellis, forming a dense hedge. Vigorous shrubby ground cover. Dense tangled mass along rocky coast and dunes. Plant in zone immediately landward of sand binders. Important food source for invertebrates. | Backdune, coastal cliffs, clay banks, coastal forest. |
| pōhutukawa | <i>Metrosideros excelsa</i> | large tree | 25m | Tolerates tough conditions but requires protection from browsing when young. Crimson flowers at Christmas. Attracts birds. | Coastal forests, coastal cliffs, backdune. |
| porokaiwhiri/ pigeonwood | <i>Hedycarya arborea</i> | tree | 15m | Attractive glossy, green leaves, bright orange fruits and black wood. Attracts birds. | Coastal forest. |
| puka | <i>Griselinia lucida</i> | tree | 8m | Large glossy-green leaf. Very attractive. | Clay banks and coastal cliffs. |
| pūriri | <i>Vitex lucens</i> | large tree | 20m | Pink flowers and berries. Prefers fertile sites. Seeds distributed by kereru/native pigeon. | Coastal forests, clay banks and coastal cliffs. |
| rangiora | <i>Brachyglottis repanda</i> | small tree | 7m | Striking large leaves with grey undersides. Creamy flowers in spring. | Clay banks and coastal cliffs, coastal forest. |
| raupō | <i>Typha orientalis</i> | bullrush | 2m | Tall, dark green foliage. Large brown seed head. Wetland plant. Will establish naturally. | Freshwater wetlands next to saltmarsh areas. |

| Māori name/ Common name | Botanical Name | Life Form | Height | Comments | Coastal Area |
|-----------------------------|---|------------------------|--------|---|--|
| remuremu | <i>Selliera radicans</i> | ground -cover | 0.1m | Very dense groundcover with pale green, fleshy leaves and small white flowers. Will establish naturally in salt marsh or coastal rocks. Very salt/drought tolerant, but does better if watered in summer. | Saltmarsh, coastal rocks. |
| rengarenga/ rock lily | <i>Arthropodium cirratum</i> | shrub | 0.5m | Tolerates light or shade. Prefers dry frost-free sites. Shiny green foliage, white flowers in late spring. | Clay banks and coastal cliffs. |
| rewarewa/ NZ honeysuckle | <i>Knightia excelsa</i> | tree | 30m | Slender tapering tree with long narrow serrated leaves. Rusty red flowers in spring and summer. | Coastal clay banks. |
| sand coprosma | <i>Coprosma acerosa</i> | ground cover | 0.5m | Small orange leaves with translucent berries. Rare in Auckland region. | Backdune. |
| sea rush | <i>Juncus kraussii</i> var. <i>australiensis</i> | rush | 0.5m | Grows in damp sand, saltmarsh and estuary margins. Dark green leaves. | Saltmarsh. |
| taraire | <i>Beilschmiedia tarairi</i> | large tree | 20m | Frost tender. Large rounded glossy leaves. Big purple fruit eaten by kereru/native pigeon. | Coastal forest, clay banks and coastal cliffs. |
| tauhinu/ cottonwood | <i>Ozothamnus leptophyllus</i> | shrub | 5m | Grey/green foliage. Very hardy. Grows in exposed sites on dry banks and will tolerate wind. Grows mainly in sand on West Coast. | Backdune, clay banks and coastal cliffs. |
| 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. | Backdune, coastal forest, clay banks and coastal cliffs. |
| tawāpou | <i>Pouteria costata</i> | tree | 15m | Hardy but frost tender. Large orange to dark crimson berries in autumn. | Coastal forest. |
| tī kōuka/ cabbage tree | <i>Cordyline australis</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. | Clay bank, backdune, coastal forest, saltmarsh/ wetlands and estuaries. |
| toetoe | <i>Cortaderia 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 late flowering. | Backdune, clay banks and coastal cliffs. |
| ureure/ glasswort | <i>Sarcocornia quinqueflora</i> | succulent | 0.1m | Short red-tipped succulent with minute flowers in summer. Forms low dense mat. Grows in salt marsh and salt meadows. Will establish naturally. | Saltmarsh. |
| wharangi | <i>Melicope ternata</i> | small tree | 8m | Frost tender when young. Attractive shiny green foliage. | Coastal forest. |
| wharanui | <i>Peperomia urvilleana</i> | herb | 0.1m | Fleshy herb forms low clumps. | Cliffs and coastal forest. |
| wharariki/ mountain flax | <i>Phormium cookianum</i> | herb | 1.5m | Drooping leaves and seedheads. Attracts birds. Frost hardy, can withstand strong coastal winds. Needs shelter to establish. | Clay banks and coastal cliffs with freshwater seepages. |
| whau | <i>Entelea arborescens</i> | small tree | 6m | Relatively short-lived. Fast growing tree with large leaves. Attractive white flowers attract birds. | Clay banks, coastal cliffs, coastal forest. |
| wiwi/ knobby clubrush | <i>Isolepis nodosa</i> | rush | 0.7m | Plant at rear of high tide beach at base of clay bank. Fine rush with creeping root mass. Needs full sun. | Saltmarsh, edges, clay banks. |

Ongoing management ...

Planting requires an ongoing commitment to **weed management** until the plants have successfully established. Remove weeds from around plants for 1-2 years following planting or until the native plants are at a height where they over top the weeds and will eventually crowd them out. In some environments where vegetation is naturally sparse, ongoing weed control will be required.

Ongoing **animal pest management** may be required as coastal conditions often provide an ideal habitat for rabbits and possums, which can cause considerable damage to natural areas and new plantings by browsing and also by burrowing in unstable areas. Possums can be a major pest in the coastal environment, damaging palatable species such as pohutukawa.

Coastal vegetation will not provide structural stability to an eroding coastline, however it will help manage erosion by providing some surface stability through vegetation cover and soil binding roots. It may be necessary to maintain your coastal planting by replanting areas that have been damaged by slips and harsh coastal conditions.

To limit the adverse effects of **pedestrians** to and along the coast ensure that appropriate access ways are provided and are clearly identified. It may be necessary to erect some temporary fencing until plants are well established.

Need More Information?

Many of the native plants listed in the coastal planting guidelines are on display at the Auckland Regional Botanic Gardens in Manurewa. Please feel free to visit the Gardens to familiarise yourself with these plants. For further information on coastal planting, local nurseries, pest control, funding opportunities, coastal management and ecological restoration please contact Enviroline on 366 2000 or check out our website – www.arc.govt.nz

Other factsheets in this series:

- 2 Dunes
- 3 Coastal forests
- 4 Coastal cliff tops
- 5 Coastal wetlands, saltmarshes and estuaries
- 6 Coastal clay banks

References

ARC, 2001. *Riparian Zone Management Guidelines*, TP148.

ARC Factsheet – *Good Start Planting Guide*.

Crowe, A., 1995. *Which coastal plant?* Viking Publishers.



THE BIG CLEAN UP.
0800 JOIN IN.



Auckland
Regional Council
TE RAUHITANGA TAIAO

FOR WAYS TO HELP THE ENVIRONMENT, JOIN THE BIG CLEAN UP, www.arc.govt.nz OR PHONE 0800 JOIN IN (56 46 46)