Tui feeding in coastal clay bank vegetation

# Coastal clay banks

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

## Coastal clay banks

The coastlines of Auckland's estuaries are often steep clay banks, cliffs or estuarine beaches. Clay banks usually comprise weakly consolidated material, which without vegetation cover may be prone to weathering and erosion, and are often fronted by intertidal flats and/or a narrow beach.

These sites, particularly intertidal flats and coastal fringe vegetation, are generally areas with high biodiversity and conservation values, as well as high social values for housing, views and recreational use. They provide important habitat for coastal birds and form part of the dynamic and ecologically important sequence of coastal vegetation. Auckland's coastline is under increasing pressure from development and population pressures.

Clay banks bordering harbours and estuaries would have naturally supported a land-to-sea sequence of native vegetation. Tall coastal forest dominated by pōhutukawa, kōwhai and kānuka would have covered upper clay bank slopes. Towards the base of the bank, this forest would have graded into lower shrubs and flax. Specialised plants able to cope with salty tidal fluxes completed the sequence, forming low saltmeadows and estuarine fringes.

Plant roots are important soil binders on clay banks. Different root structures can work together to help stabilise banks and reduce runoff and erosion. Herbaceous and shrubby plants have shallower root systems while larger trees usually have spreading and deeper roots.

**Generally, plants help to slow erosion of clay banks because:**

- foliage breaks the impact of rain drops
- plants take up water, which reduces runoff and soil saturation
- plant roots improve permeability of the soil
- roots and stems increase the roughness of the soil surface, increasing infiltration and reducing runoff; and
- roots bind the soil and help to reduce slips.

**Protect. Restore. Connect.**

Auckland Council
Te Kaunihera o Tāmaki Makaurau

## Planting list

Species suitable for planting on clay banks, and readily available at Auckland garden centres/nurseries, are listed in the following table. Where practicable plants/seeds should be obtained from local sources (i.e. 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.

## 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 kohekohe need to be planted more than 5m apart. Set plants out in groups and plant closely to each other to provide sheltered environments.

## To establish new coastal forest:

### Initial plantings (stage 1 planting)

Initial plantings need to establish coloniser vegetation. Coloniser species are those plants able to cope with drier, hotter conditions in open areas and should make up the bulk of a planting. Coloniser plants will provide shelter for other species to establish naturally. Consider planting a mixture of wind and bird dispersed species to help assist natural regeneration processes.

### Enrichment plantings (stage 2 planting)

Sometimes enrichment planting will be required to assist with providing a natural species composition within the planting, such as when natural dispersers are absent e.g. birds, or the planting is isolated from natural seed sources. Planting should be completed in stages. Once initial colonisers (stage 1) have become established (several years) and have begun to provide shade and shelter, stage 2 planting of enrichment species, can be 'interplanted' between the original plants.

### Species abundance

The 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.

| Maori name/ common name | Botanical name | Lifeform | Height | Abundance | | Comment |
|---|---|---|---|---|---|---|
| | | | | (+++ use plentifully, ++ use commonly, + use sparingly) | | |
| | | | | **Initial plantings** stage 1 | **Enrichment plantings** stage 2 | |
| karamū | *Coprosma robusta or C. macrocarpa* | shrub or small tree | 5m | +++ | | Hardy shrub with abundant orange berries in late summer-autumn. Moderate salt tolerance. Attracts birds. |
| mānuka | *Leptospermum scoparium* | small tree | 8m | +++ | | Grows vigorously and has a wide ecological tolerance. Important coloniser species. Forms well developed root system that stabilises banks. White flowers. Avoid disturbing roots when planting. |
| māhoe | *Melicytus ramiflorus* | tree | 10m | +++ | | Fast growing tree. Good for damp shady sites. Very hardy. |
| rengarenga/rock lily | *Arthropodium cirratum* | shrub | 0.5m | ++ | | Tolerates light or shade. Prefers dry frost-free sites. Shiny green foliage, white flowers in late spring. |
| pōhuehue/wire vine | *Muehlenbeckia complexa* | vine | 1m | ++ | | Hardy, ideal for banks and other difficult sites. Vigorous shrubby ground cover. Dense tangled mass along rocky coast and dunes. Important food source for invertebrates. |
| whararikī/ mountain flax | *Phormium cookianum* | herb | 1.5m | ++ | | Drooping leaves and seed heads. Attracts birds. Frost hardy, can withstand strong coastal winds. Grows in freshwater seepages. |
| kōwharawhara/ coastal astelia | *Astelia banksii* | herb | 1-2m | ++ | ++ | Grows on rocks, banks and as an epiphyte often on pohutukawa. Long drooping leaves of silver-green colour. Greenish flowers followed by purple fruit. |
| harakeke/flax | *Phormium tenax* | 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. Attracts birds. |
| taupata | *Coprosma repens* | shrub or small tree | 2-4m | ++ | | Large shrub with dark green, glossy, rounded leaves. Very hardy, excellent wind and seaspray shelter. Orange berries attract birds. |
| koromiko | *Hebe stricta or H. macrocarpa* | shrub | 4m | ++ | | Coloniser. Long, white flower spikes in spring. Excellent on open sites. |
| whau | *Entelea arborescens* | small tree | 6m | ++ | | Relatively short-lived. Fast growing tree with large leaves. Attractive white flowers attract birds. |
| māpou | *Myrsine australis* | tree | 7m | ++ | | Slender tree with red stems. Hardy. Attracts birds. |
| kānuka | *Kunzea ericoides* | tree | 16m | ++ | | Good colonising species. White flowers (spring-summer). |

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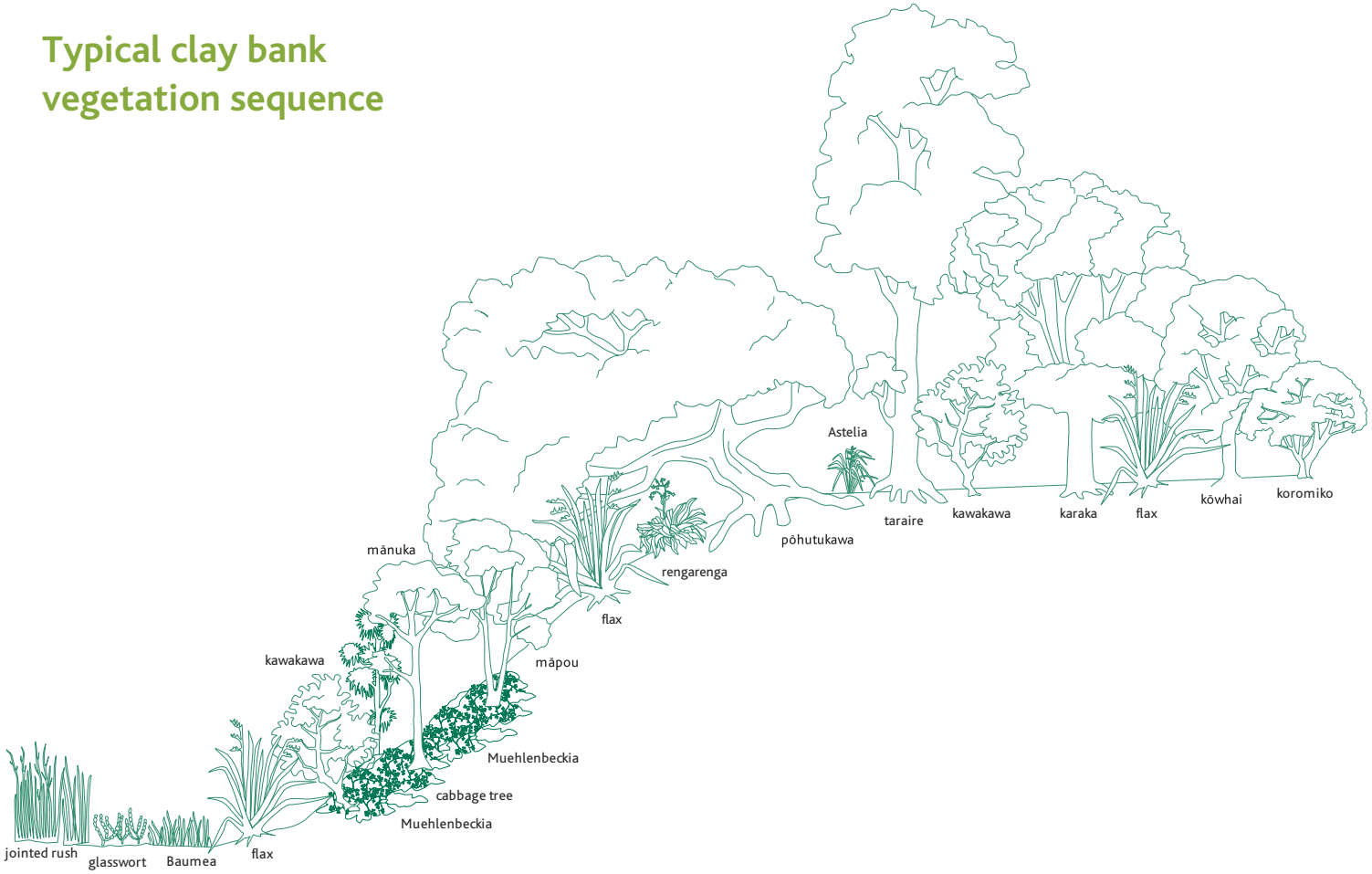
| tī kōuka/ cabbage tree | *Cordyline australis* | tree | 17m | ++ | | Erect tree with crown of narrow leaves tufted at the end of branches, white flowers in spring. Requires some protection when young. Moderate tolerance to salt and wind. |
| pōhutukawa | *Metrosideros excelsa* | large tree | 25m | ++ | ++ | Avoid planting on outer most edge of unstable banks. Tolerates tough conditions but requires protection from browsing when young. Crimson flowers at Christmas attract birds. |
| *Machaerina juncea* | *Machaerina juncea* | sedge | 1m | + | | Found in lowland coastal swamps , saltmarsh areas and base of coastal clay banks in estuarine areas. |
| houpara/coastal five finger | *Pseudopanax lessonii* | small tree | 7m | + | ++ | Good colonising plant. Grows to a large tree. Glossy leathery leaves. Responds well to pruning. Very hardy. |
| karo | *Pittosporum crassifolium* | small tree | 10m | + | | 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. |
| kōwhai | *Sophora chathamica* | tree | 20m | + | + | Primarily a species of coastal forest, often on cliff faces or banks overlooking estuarine rivers or inlets. Common around Auckland. Sophora fulvida should be planted on Waitakere west coast only |
| hangehange | *Geniostoma ligustrifolium var. ligustrifolium* | shrub or small tree | 4m | | + | Lowland shrub with light green foliage. Needs protection from wind when young. Useful understorey species. |
| akepiro | *Olearia furfuracea* | small tree | 7m | | + | Exposure tolerant. Daisy like flowers in summer |
| kawakawa | *Macropiper excelsum* | 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. |
| rangiora | *Brachyglottis repanda* | small tree | 7m | | + | Striking large leaves with grey undersides. Creamy flowers in spring. |
| puka | *Griselinia lucida* | tree | 8m | | + | Large glossy-green leaf. Very attractive. |
| wharangi | *Melicope ternata* | small tree | 8m | | + | Frost tender when young. Attractive shiny green foliage. |
| mākaka/ NZ broom | *Carmichaelia australis* | small tree | 10m | | + | Small bush with lavender flowers. |
| kohekohe | *Dysoxylum spectabile* | large tree | 17m | | + | Needs shelter and is frost tender. Flowers and fruit attracts birds. |
| karaka | *Corynocarpus laevigatus* | tree | 18m | | + | Hardy, leafy canopy tree. Produces large numbers of bright yellowish orange fruit in summer. |
| porokaiwhiri/ pigeonwood | *Hedycarya arborea* | tree | 15m | | + | Attractive glossy, green leaves, bright orange fruits and black wood. Attracts birds. |
| pūriri | *Vitex lucens* | large tree | 20m | | + | Pink flowers and berries. Prefers fertile sites. Seeds distributed by kereru/native pigeon. |
| rewarewa/ NZ honeysuckle | *Knightia excelsa* | tree | 30m | | + | Slender tapering tree with long narrow serrated leaves. Rusty red flowers in spring and summer attracts Tui. |

Kawakawa leaves

# Typical clay bank vegetation sequence




Tawharanui coastline – typical clay bank vegetation

## 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 check out our website www.aucklandcouncil.govt.nz

**Other factsheets in this series:**

**01** Coastal planting guide

**02** Dunes

**03** Coastal cliff tops

**04** Coastal clay banks

**05** Coastal wetlands, saltmarshes and estuaries

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