Ngā tāhuahua, ngā ākau tokatoka me ngā whīra pātītī
Sand dunes, rocky shore and turf fields

Wellington's coastal fringe is a wild and dynamic mix of dunes, rocky foreshore and turf fields (or herb fields). A history of clearance and development for housing, roading, rail and industry has significantly changed the shape and nature of the coastal fringe native plant and animal communities.

Restoring these areas provides habitat for species like banded dotterel, little penguin and geckos. It also helps to bring back some of Wellington's unique plant species that would once have clung to the rocks, sprawled across the gravels, and hugged the sands.

Ngā tāhuahua
Sand dunes

Coastal dunes remain in small pockets from Owhiro Bay around the coast to Karori Stream.

These tiny areas are the best remaining dune sites in Wellington. This section of the South Coast is the only site in the North Island where Marlborough 'Minimac' geckos occur.

Other dune areas, like Lyall Bay, Seatoun and Worser Bay, are much narrower than they would have been originally and are managed to balance both the ecological and recreational values of Wellingtonians.

The aim of restoration planting on sand dunes is to establish the foredune with spinifex and pīngao and progressively plant the backdune where there is space. This will increase diversity and natural resilience.

(Above) Three children, sitting on a hillside, look down over Lyall Bay, toward Moa Point. Taken circa 1895.

(Left) Lyall Bay with Moa Point in the background. Note the airport and area of housing that is now covering all of the dune area, August 2020. The dune area is now restricted to a narrow strip due to housing and road infrastructure. The dunes in 1895 were quite extensive and would have had a full foredune and backdune structure.

(Left) Spinifex seedling exposed by wind action. Plant sand binding species deeply or they will be blown out of the dune in the Wellington winds.

(Right) Spinifex, growing well at Princess Bay.

Nōhanga
Habitat

Foredunes and backdunes

Sand dune systems are naturally dynamic. Sand is constantly moving between the sea, beach and the dunes. This process is hardly noticeable most of the time but can be dramatic during storms.

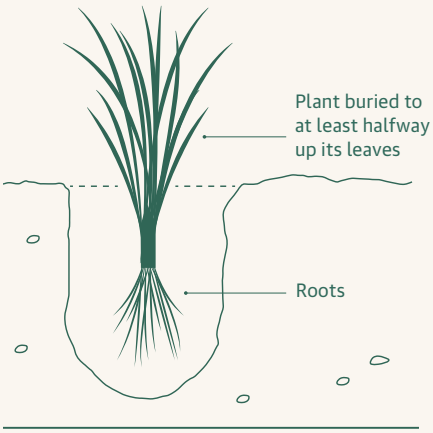
During storm events, large waves erode the beach level, depositing sand out to sea as sand bars. Following storm events, the sand is slowly deposited back on shore and blown back into the foredunes (dune closest to the sea).

Our two native foredune plants, spinifex and pīngao, are specially adapted to catch this windblown sand and trap it to re-build dunes. Both plants are stimulated to grow when they are buried by windblown sand. They send out trailing roots that grow and move with the sands, effectively 'binding' the sand to form low, regular and stable dunes. The width of the dune area, dune sand binders and accumulating driftwood all help to trap the drifting sand.

Behind the foredunes, further from the sea, are the backdunes. These are typically sedges and rushes merging into coastal shrubs. Very few areas of naturally occurring backdunes remain in Wellington because they have been heavily modified by development and separated from foredune areas by roads.

Backdunes are more stable than foredunes and support a wider range of species. Although slightly less exposed than foredunes, they are still prone to salt spray and wind during storms. Plants need to be firmly planted into the ground and, if in sand, buried past the crown to ensure survival.

Diagram of planting spinifex and pīngao



Tips for planting spinifex and pīngao on the foredunes

You may need to fence off your planting site to reduce any damage from people and dogs. Make sure public accessways are clearly defined. Talk to a Wellington City Council Ranger for advice.

Marram grass, an exotic species, was planted on many dunes in Wellington in the 1900s. It is invasive and forms tall steep, less stable dunes. Remove all marram before planting unless you have a very large site where removing it all at once may cause significant sand loss.

Plant spinifex and pīngao on the toe of the dune, above the high tide mark.

When setting plants out, follow the natural curves of any existing vegetation or plant in groups. Avoid planting in straight lines as this will cause wind funnelling.

Space plants no more than 50cm apart.

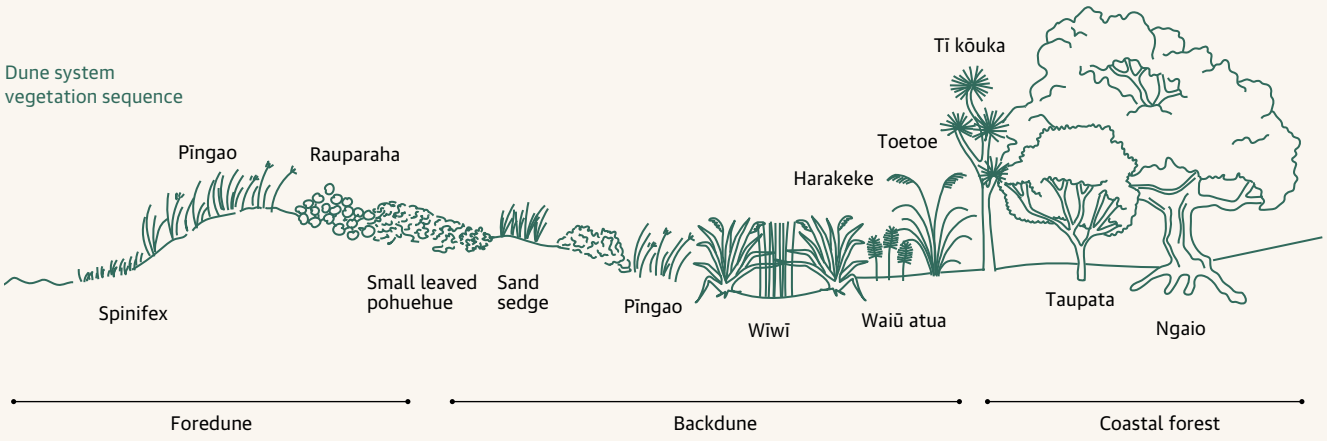
Place one single slow release fertiliser tablet in the bottom of each planting hole to assist with initial plant establishment or apply fertiliser around the plant during the growing season.

Bury spinifex and pīngao partway up the leaves when planting, preferably in contact with moist sand.

Rabbits will eat young dune plants. Use rabbit repellent and protect seedlings on the backdune with tree shelters.

Common dune weeds are lupin, climbing dock, sea couch and gazania. Hand pulling is often the best way to remove these weeds on dunes because of the loose sandy soils.

Foredune with pīngao spreading out by runners and back dune with wīwī and coastal shrubs, Tarakena Bay.



Plant list for sand dunes in Wellington

Sand dunes		Planting site		Life form	Plant preferences & tolerances				Abundance	
Māori/ Common name	Botanical name	Fore dune	Back dune		Soil moisture needs	Light levels	Frost tolerant	Wind tolerant	Early stage / initial planting	Later stage / shelter established
Pīngao / Golden sand sedge	*Ficinia spiralis*	•	•	Sedge	Semi-moist	Sun	Moderate	✓	+ + +	
Kōwhangatara /Spinifex	*Spinifex sericeus*	•		Grass	Semi-moist	Sun	Moderate	✓	+ + +	
Sand sedge	*Carex pumila*	•	•	Sedge	Semi-moist	Sun	Moderate	✓	+ +	
Hinarepe / Sand tussock	*Poa billardierei*	•		Grass	Semi-moist	Sun	Moderate	✓		+
Sand bidibidi	*Acaena pallida*		•	Herb	Semi-moist to dry	Sun	Moderate	✓		+
Rauparaha / Shore bindweed	*Calystegia soldanella*	•	•	Herb	Semi-moist to dry	Sun	Moderate	✓		+ +
Wīwī / Knobby club rush	*Ficinia nodosa*		•	Sedge	Moist	Sun	Moderate	✓	+ +	
Sand coprosma	*Coprosma acerosa*		•	Scrub	Semi-moist to dry	Sun	Moderate	✓		+ +
Waiu-atua / Shore spurge	*Euphorbia glauca*		•	Herb	Semi-moist	Sun	Moderate	✓		+
Small leaved pohuehue	*Muehlenbeckia complexa*		•	Scrambler	Semi-moist to dry	Sun	✓	✓	+ +	
Harakeke / Flax	*Phormium tenax*		•	Flax	Moist	Sun	✓	✓		+ +

+ use sparingly ++ use commonly +++ use plentifully ✓ yes • categorised

Ngā tāhuahua me ngā whīra pātītī
Rocky shore and coastal turf fields

Wellington's rocky shore is made up of rocky outcrops interspersed with debris fans spilling out of gullies, gravel beaches and coastal turf fields. Rocky shore plants are adapted to tolerate salt, infertile soil, wind and drought. They have thicker, shorter, fleshier leaves and will grow to the conditions, often appearing sculptured by the wind. The hardy mingimingi can grow to 3m tall in a sheltered site but will grow as a low cushion along the Wellington coastal fringe.

Rocky shore vegetation is sadly depleted in Wellington. Remnants of natural vegetation can be found clinging to rocky outcrops, like thick leaved māhoe, small leaved pohuehue and other wind sculpted shrubs. Between these plants are small pockets of native grasses, sedges and herbs.

Coastal turf fields are classified as nationally critically endangered and few remain intact in the country. A few areas still remain on Taputeranga Island, Houghton Bay and around the South Coast.

Tips for rocky shore and turf fields

Shelter is key in these areas - use a limited range of very hardy plant species in the first few years to establish shelter and then gradually add in other types of plants.

These areas often have very compacted ground/soil. When planting, look for natural shelter at the base of rocks or close to existing vegetation to plant in to. These areas often have higher moisture levels.

Add coastal stone mulch to help retain moisture.

Control weeds and animal pests to help seedlings naturally regenerate.

(Above) Newly planted area at Oruaiti Reserve, including taupata, oioi, silver tussock and whaririki. Taupata plants can be seen clinging to the cliff faces and foreshore.

(Below) Planting is slowly establishing at this extremely windy site on the rocky shore at Te Raekaihau Point. Silver tussock is one of the few plants that will survive this tough environment.

New Zealand celery and glasswort, sheltering at the base of rocks. Many seepage plants such as glasswort are difficult to grow in nurseries and are best left to naturally establish.

(Left) A coastal turf, area of brackish water surrounded by remuremu and shore primrose. This type of environment is often damaged in storms or from trampling.

(Right) Rocky shore planting at Ōwhiro Bay. Image Sue Reid.

Coastal turf fields contain ground-hugging short herbs, grasses and sedges. They usually form on solid exposed rock headlands with a layer of peat or consolidated sands and gravel. These areas are prone to constant salt-laden winds and wave splash and occasional inundation during high tides or storm surges. They are often damaged in storm events and from trampling. Plants growing in these zones are halophytic - salt tolerant.

Within pockets of rocks throughout the rocky shore and turfs are small brackish wet areas called seepages, often supporting salt marsh ribbonwood and oioi.

Often, the best management for rocky shore and turf fields is to control the weeds and leave the rest to nature. Wellington City Council is undertaking weed management at sites around the South Coast to protect these areas from exotic weed species.

Plant list for rocky shore in Wellington

Rocky shore		Life form	Plant preferences & tolerances				Abundance	
Māori/ Common name	Botanical name		Soil moisture needs	Light levels	Frost tolerant	Wind tolerant	Early stage / initial planting	Later stage / shelter established
Blue wheat grass	*Anthosachne solandri*	Grass	Semi-moist	Sun	✓	✓		+
Coastal tree daisy	*Olearia solandri*	Shrub	Semi-moist	Sun	✓	✓	+ +	
Horokaka / NZ ice plant	*Disphyma australe*	Herb	Semi-moist	Sun	Frost tender	✓	+ +	
Māhoe / Thick leaved māhoe	*Melicytus crassifolius*	Stout bushy shrub, 1.5m	Semi-moist	Sun	Moderate	✓		+
Mingimingi	*Coprosma propinqua*	Shrub	Semi-moist	Sun	✓	✓	+ + +	
Pinātoro	*Pimelea prostrata*	Herb	Semi-moist	Sun	Moderate	✓		+
Broadleaved poa	*Poa anceps*	Grass	Semi-moist	Sun	Moderate	✓		+
Silver tussock	*Poa cita*	Grass	Semi-moist	Sun	✓	✓	+ + +	
Pohuehue / Small leaved pohuehue	*Muehlenbeckia complexa*	Scrambler	Semi-moist	Sun	✓	✓	+ + +	
Puawānanga / Small white clematis	*Clematis forsteri*	Climber	Semi-moist	Sun	Moderate	✓		+
Rauparaha / Shore bindweed	*Calystegia soldanella*	Herb	Semi-moist	Sun	Moderate	✓	+	
Sand coprosma	*Coprosma acerosa*	Ground cover / Shrub	Semi-moist	Sun	Moderate	✓		+
Sand sedge	*Carex pumila*	Sedge	Semi-moist	Sun	Moderate	✓	+ +	
Scab weed	*Raoulia hookeri subsp. hookeri*	Herb	Semi-moist	Sun	Moderate	✓		+
Taramea	*Aciphylla squarrosa var. squarrosa*	Herb	Semi-moist	Sun	✓	✓		+ +

+ use sparingly ++ use commonly +++ use plentifully ✓ yes • categorised

Plant list for rocky shore in Wellington (cont.)

Rocky shore		Life form	Plant preferences & tolerances				Abundance	
Māori/ Common name	Botanical name		Soil moisture needs	Light levels	Frost tolerant	Wind tolerant	Early stage / initial planting	Later stage / shelter established
Tauhinu	*Ozothamnus letophyllus*	Shrub	Semi-moist	Sun	Moderate	✓		+ +
Taupata	*Coprosma repens*	Shrub	Semi-moist	Sun	Frost tender	✓	+ +	
Toetoe	*Austroderia toetoe*	Grass	Semi-moist	Sun	✓	✓	+ +	
Waiū atua/ Shore spurge	*Euphorbia glauca*	Herb	Semi-moist	Sun	Moderate	✓		+
Whaririki/ Mountain flax	*Phormium cookianum subsp. hookeri*	Herb	Semi-moist	Sun	✓	✓	+ + +	
Wīwī/ Knobby club rush	*Ficinia nodosa*	Sedge	Semi-moist	Sun	Moderate	✓	+ + +	

\+ use sparingly ++ use commonly +++ use plentifully ✓ yes • categorised

Plant list for coastal turf fields and seepages

Coastal turfs & seepages (seep's)		Site type		Plant type	Plant Preferences				Abundance	
Māori/ Common name	Botanical name	Turfs	Seeps	Plant type	Soil moisture needs	Light levels	Frost tolerant	Wind tolerant	Early stage / initial planting	Later stage / shelter established
Oioi	*Apodasmia similis*	•	•	Sedge	Semi-moist	Sun	Moderate	✓	+ + +	
Remuremu	*Selliera radicans*	•	•	Herb	Semi-moist	Sun	✓	✓	+	
Salt marsh ribbonwood	*Plagianthus divaricatus*		•	Shrub	Semi-moist	Sun	Moderate	✓	+	
Kāpūngāwhā / Lake clubrush	*Schoenoplectus tabernaemontani*		•	Rush	Semi-moist	Sun	✓	✓	+ +	
New Zealand Celery	*Apium prostratum subsp. prostratum*	•	•	Herb	Semi-moist	Sun	✓	✓	+ +	

\+ use sparingly ++ use commonly +++ use plentifully ✓ yes • categorised