

Ngā wahapū, ngā repo wai tai me ngā rohe kōreporepo wai māori

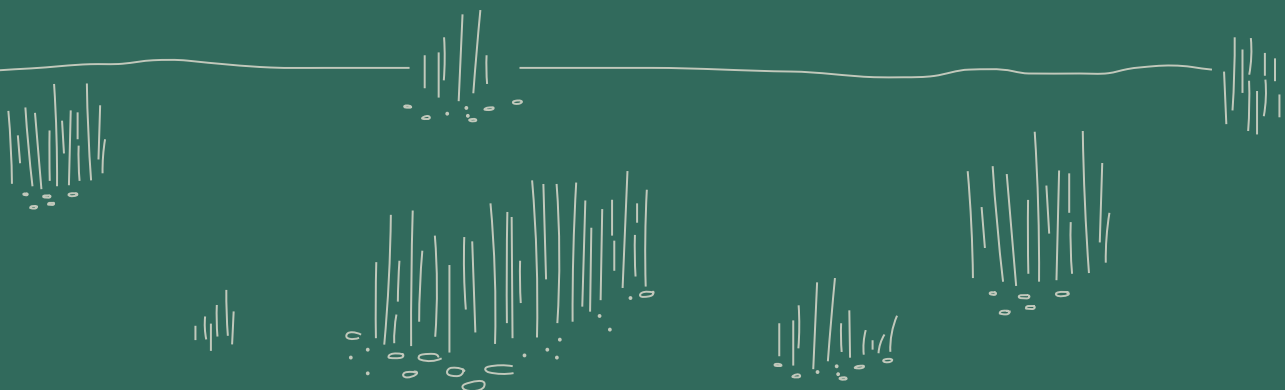
Estuaries, saltwater marshes and freshwater wetlands

Wellington's landscape of steep catchments, basins and extensive coastline, along with our high rainfall, would naturally support an extensive network of bogs, salt marshes, estuaries and freshwater wetlands. However, over time as the city was developed, most of these wet areas were drained, piped, channelled or built over. Those that remain are precious.

Makara estuary is the biggest and best salt marsh in the city and well worth a visit. It is a spawning ground for inanga and is home to many species of wetland birds and coastal waders including the threatened Reef heron, Caspian tern and Pied shag. Zealandia's lake, edges and wetlands are being restored and provide habitat for plants and animals. Very few bogs and seepages still remain, but those that do are very small, often in pasture and heads of some streams. Opau

Bay in Makara area is one of the few remaining areas of wetland with ti kouka and raupō still present in Wellington City boundaries.

Restoring or creating additional wetland areas - no matter how small - will help support the return of wildlife specifically adapted to wetland ecosystems.



Ngā nōhanga rohe kōreporepo

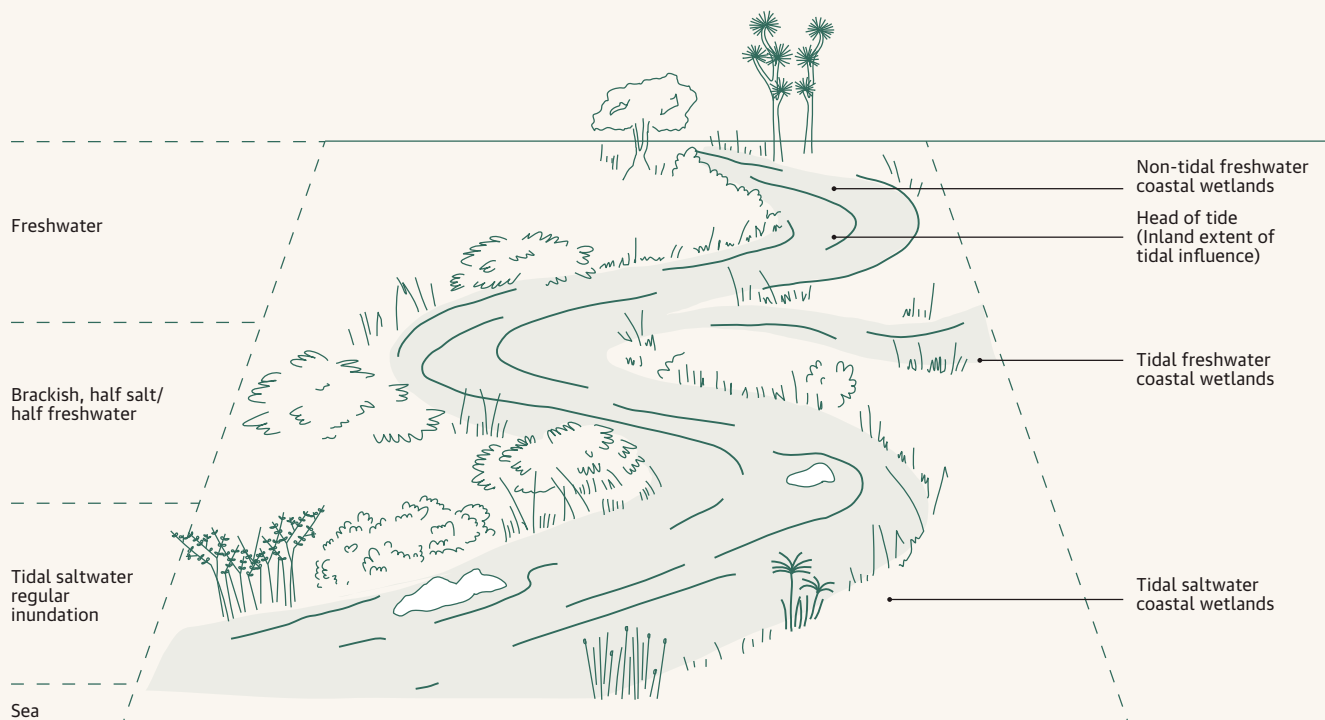
Wetland habitats

Wetlands are areas where water accumulates naturally such as where land meets streams, rivers, lakes and the sea. They could be permanently or intermittently wet.

Healthy and functioning wetlands act like a giant sponge - helping to naturally regulate water flow and quality. Their plants slow the flow of water from the land so in times of flood more can be absorbed into the soil. In summer, stored water is slowly released, maintaining water flows. Micro-organisms (fungi and bacteria) in the damp soils clean the water by absorbing, breaking down and recycling nutrients.

Wetlands are one of our most productive ecosystems. They support a rich diversity of plant and animal life that is uniquely adapted to a variety of conditions from wet to dry, salty to freshwater and constantly changing water levels.

Wetlands are deeply embedded in kaupapa Māori as they provide and nurture important plants and animals used for food, medicine, building and weaving.



Te whakaora rohe kōreporepo

Restoring wetlands

If your aim is to restore the natural wetland system you will need to consider restoring natural water levels and flow. This may involve engineering solutions and impact on existing infrastructure so get advice from Council before you start.

Once an area is fenced, water levels are restored or adequate, and weeds and pests controlled, native wetland and estuarine plants should come back themselves. However, planting can speed up the natural process and help to fill in space that would otherwise be overtaken by weeds.

Different plants will grow in freshwater wetlands to salt water wetlands. Make sure to choose plants that are tolerant to your site conditions, see the plant lists in the following pages of this chapter.

Tips for restoring wetlands in Wellington

Get a good pair of gumboots!

Get advice on whether the water levels or flows could be improved and how to do this.

Fence the wetland from any stock and plan for planting and maintenance activities. Also check if the area is used for any recreational activities and what access is needed.

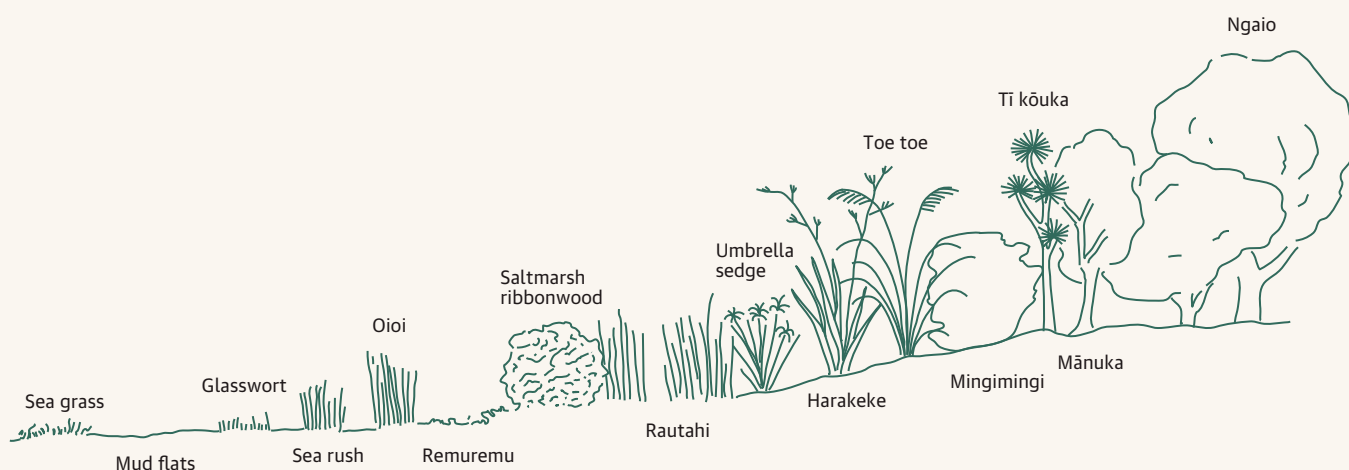
Control weeds and animal pests (eg pampas, blackberry, possums, rats, stoats, feral cats).

Plant spacings will differ depending on the plant. Plant rushes and sedges 0.5m apart and larger shrubs and trees 1-1.5m apart. See *Restoration Planting Techniques* for the Wellington conditions.

Set plants out in groups of 3-5 so plants give each other shelter and make sure the person/people setting out plants knows how to match them with the various water and salt levels across the site.

Larger trees, such as kahikatea will need to be at least 5m apart.

Use the abundance measure indicated in the table to work out the proportion of each plant to set out. This will replicate natural species abundance and groupings.



(Above) Vegetation sequence for estuarine wetland in Wellington

Ngā rohe kōrerorepo takutai

Coastal wetlands

Estuaries

Estuaries form at the coast where fresh water in rivers and streams meets and mixes with salt water from the sea, often forming small lagoons or swampy areas. They are the most productive of all wetlands and especially rich in animal life. Not many plant species grow in the subtidal zone or intertidal zone except for sea grass.

Saltmarshes

Inland, from the sea to the edges of an estuary, saltmarsh vegetation grows; typically low-growing and very wind and salt tolerant. The marsh areas are regularly inundated with saltwater and the plants have adapted to growing in this salty environment. Many of these species are difficult to cultivate. Salt marsh ribbonwood and oioi can be established in low-lying damp areas.

“Coastal estuaries are so exposed, especially in Wellington. We don't just get windstorms, we get salt storms! Be really careful with plant selection. We started with just oioi and planted thousands of them. We transformed the eroding banks.

Now the banks are stabilised, we are planting in the middle of the islands. We found that salt marsh ribbonwood wasn't tough enough by itself and needs shelter. Even ngaio is stripped of its leaves in a salt storm. We built driftwood shelters and placed boulders and planted on the leeward side of them.”

Rebecca, Makaracarpa community group, Makara Estuary



(Above) Sea rush, oioi and salt marsh ribbonwood along the edges of the Makara Estuary, providing important habitat for the coastal sea birds.

(Right) Makara Estuary, further upstream, still with brackish water, dominated by cutty grass and salt marsh ribbonwood.



Plant lists for coastal estuaries and salt marshes

Coastal estuaries & salt marsh		Life form	Plant preferences & tolerances				Abundance	
Māori/ Comon name	Botanical name		Soil moisture needs	Light levels	Frost tolerant	Wind tolerant	Early stage	Later stage
Glasswort	<i>Salicornia quinqueflora</i>	Herb	Moist	Sun	Frost tender	Exposed		++
Kāpūngāwhā	<i>Schoenoplectus tabernaemontani</i>	Rush	Wet	Sun	✓	Exposed	+++	
Mākaka/ Saltmarsh ribbonwood	<i>Plagianthus divaricatus</i>	Shrub	Moist	Sun	Moderate	Exposed	++	+
Oioi/ Jointed wire rush	<i>Apodasmia similis</i>	Rush	Moist	Sun	✓	Exposed	+++	
Remuremu	<i>Selliera radicans</i>	Herb	Moist	Sun	✓	Exposed		++
Sea rush	<i>Juncus kraussii subsp. australiensis</i>	Rush	Wet	Sun	✓	Exposed	++	
Sea primrose	<i>Samolus repens</i>	Herb	Moist	Sun	✓	Exposed		++
Sea blight	<i>Suaeda novae-zelandiae</i>	Herb	Moist	Sun	Frost tender	Exposed		+
Umbrella sedge	<i>Cyperus ustulatus</i>	Sedge	Moist	Sun	✓	Exposed	++	

Note: Some species will be difficult to obtain for planting projects as they are not easy to grow in plant nurseries.

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

Ngā rohe kōreporepo wai māori

Freshwater wetlands

Swamps, seepages, bogs and shallow lakes

Few freshwater wetlands remain in Wellington and most have had their natural water flow modified by draining, piping or infill. Seepages may stop flowing altogether over the drier summer months. They are also often grown over or around with weeds.

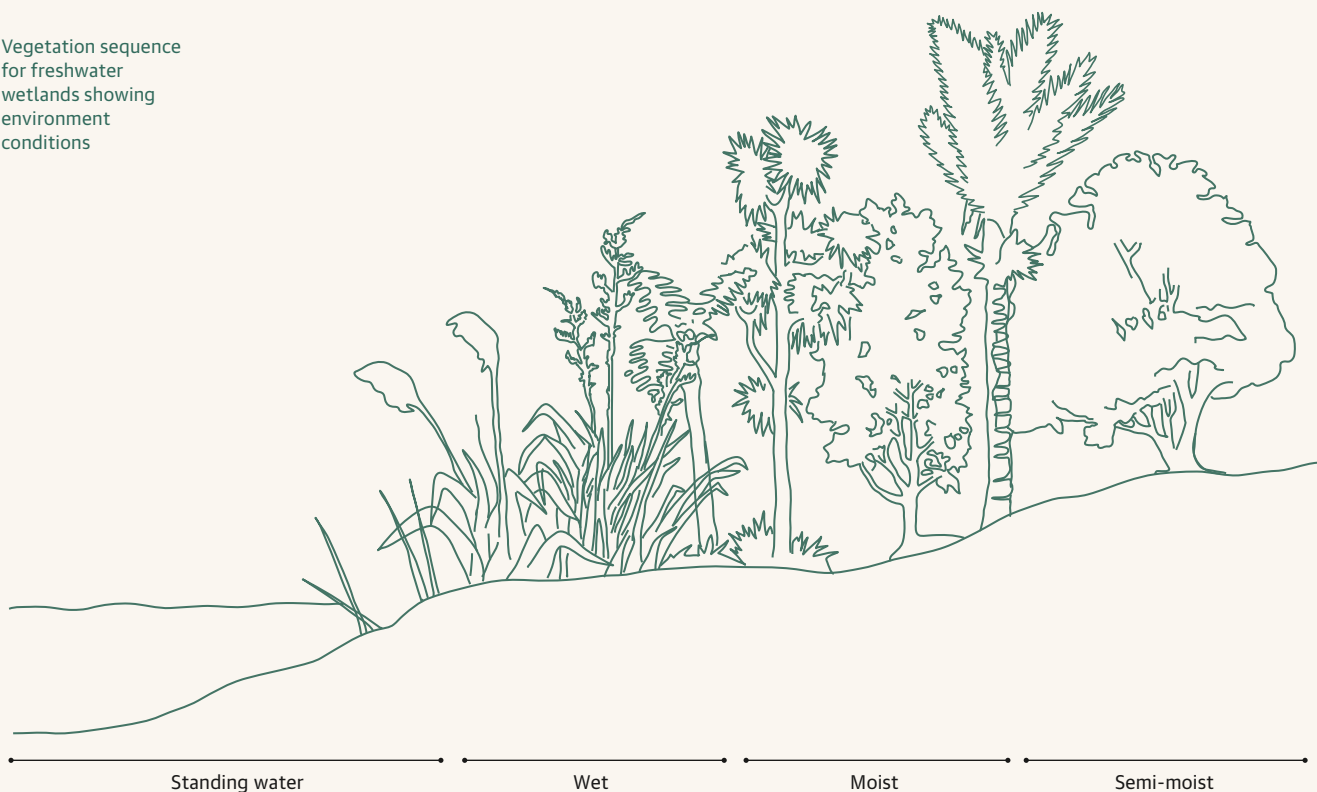
The range of plants growing in these habitats depends on proximity to the coastal or inland areas and is generally dominated by sedges and rushes. Wetlands are fragile so protecting the edges is important - choose plants from the wet to semi-moist zones to protect wetland edges from the table.

(Below, left) Rautahi growing well with toetoe and harakeke, Lake Kohangapiripiri

(Below, right) Rautahi in foreground with raupō dominating the lake edges. Lake Kohangapiripiri is located east of Pencarrow Head. Although not in the Wellington City Council boundary, it is a good example of a sedge and rush dominated wetland



Vegetation sequence for freshwater wetlands showing environment conditions



Plant list for freshwater wetlands

Freshwater wetlands		Site type See previous diagram			Plant type	Plant preferences & tolerances				Abundance	
Māori/ Comon name	Botanical name	Standing water	Wet	Moist / semi moist	Plant type	Soil moisture needs	Light levels	Frost tolerant	Wind tolerant	Early stage	Later stage
Giant rush	<i>Juncus pallidus</i>	•	•		Rush	Moist	Sun	Frost tender	Exposed	++	++
Harakeke / Swamp flax	<i>Phormium tenax</i>		•	•	Herb	Moist	Sun	✓	Exposed	++	
Kāpūngāwhā	<i>Schoenoplectus tabernaemontani</i>	•	•		Sedge	Wet	Sun	✓	Exposed	+++	+
Mānuka	<i>Leptospermum scoparium</i>		•	•	Tree	Moist	Sun	✓	✓		++
Mingimingi	<i>Coprosma propinqua</i>			•	Shrub	Moist	Sun	✓	✓		++
Pūkio / Swamp sedge	<i>Carex virgata</i>		•	•	Sedge	Wet	Sun	✓	Exposed	++	
Pūrei	<i>Carex secta</i>	•	•	•	Sedge	Wet	Sun	✓	Exposed	+++	
Raupō / Bullrush	<i>Typha orientalis</i>	•			Rush	Wet	Sun	✓	Exposed	+	
Rautahi / Cutty grass	<i>Carex geminata</i>		•	•	Sedge	Wet	Sun	✓	Exposed	+++	
Rautahi / Cutty grass	<i>Carex lessoniana</i>		•	•	Sedge	Wet	Sun	✓	Exposed	++	
Ti kōuka / Cabbage tree	<i>Cordyline australis</i>			•	Tree	Moist	Sun to semi-shade	Exposed ✓	✓		++
Toetoe	<i>Austroderia toetoe</i> or <i>A. fulvida</i>		•	•	Grass	Moist	Sun	✓	✓		++
Umbrella sedge	<i>Cyperus ustulatus</i>			•	Sedge	Moist	Sun	✓	✓	++	

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