

Ngā tahataha manga

Stream sides

Wellington's hilly landscape is drained by streams with comparatively small catchments close to the coast. Most of the city's streams have been significantly modified over time by vegetation clearance and engineering to channel and pipe water away from housing, road and rail. Very few streams flow along a completely unmodified course from catchment to sea, with some being completely piped underground through the city. However, even with the significant changes that have occurred, Wellington streams are home to several nationally threatened species including the giant kōkopu, longfin eel and shortjaw kōkopu.

Although many of the city's streams are small, with some only running at certain times of the year, their health is important for the health of the harbour and sea they flow into.

Significant efforts are being made by community groups and landowners to improve the health of streams throughout the city by restoring their riparian margins. For example, the *Kaiwharawhara Stream Project* aims to create an eco-corridor along the length of the stream from Karori through Otari and Wellington's western suburbs to its outlet at the western shore of Wellington Harbour.



Ngā tahataha wai māori

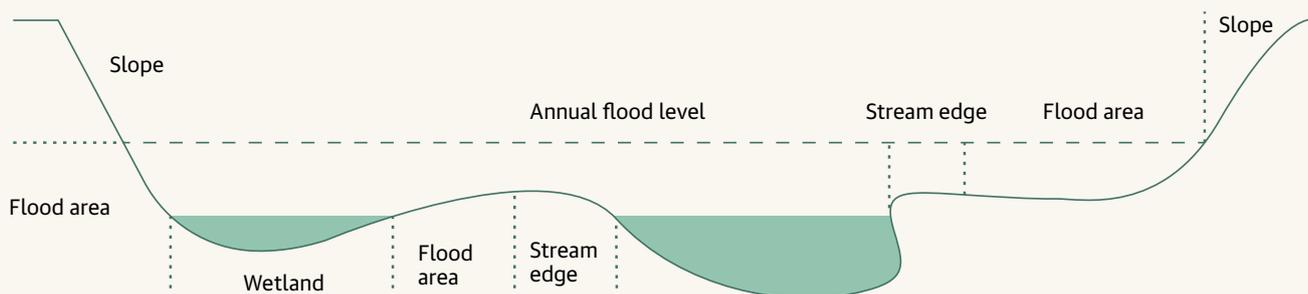
Riparian margins

Riparian margins are the borders along or around streams, lakes, rivers and other bodies of surface water. The areas include both the immediate edges and banks of the water body as well as the floodplain where water will reach periodically during high rainfall (see below). They support a wide range of plants and animals because of the range of habitat conditions available, from very wet and swampy to drier banks, varying temperatures and light levels (see right).

Riparian plants are very important for water quality and erosion control. They act like sponges, slowing down surface and ground water as it runs off land, filtering out nutrients, pollutants and sediment. They create habitat for aquatic wildlife and help keep the stream cool and shaded.



Showing planting zones before planting a site, check where the likely floodplain would be.



Stream cross section showing edges, banks and floodplain

The aim of riparian planting in Wellington is to recreate the right conditions so that overall stream health can recover. Ultimately this means restoring an over-arching canopy along both sides of a stream to provide shade and shelter. This will encourage aquatic species and help control exotic weed species that require good light levels and high nutrient levels to flourish.

Tips for restoring streams in Wellington

Get a good pair of gumboots!

Look at the whole stream, find out who owns it, whether you need permission to work on it and who could help. Look for any engineering works like culverts and check with Council how best to manage these areas.

Identify any weeds and animal pests and decide which are important to control and how you will do it. Water weeds like *monkey musk* and *water celery* are difficult to control so get some advice on weed control methods.

Stream edges are often infested with weeds like *Tradescantia*/ Wandering Willie. Removing these plants can increase erosion until new seedlings have established. Time your work programme so that you plant the stream edges soon after weed removal to minimise how long the edges are bare. Plant close together (50cm) to ensure quick ground cover. If you are working on a large site, consider breaking it in sections and staging it over a couple of years to ensure good ground cover of plants throughout the project.

Identify the different planting 'zones' along your stream, edges, banks and drier areas further back. Draw up a *planting plan* showing which plants are suitable for which sites and make sure the person(s) who set out the plants matches them to the site conditions.

Set out plants in groups along the stream, rather than lines so that the water doesn't channel between them and so they look more natural.

Plant seedlings firmly into the ground so that they don't move as the water rises. Check out our *Restoration Planting Techniques* guidelines for more information.

When planting stream edges, choose plants that will bend with the water flow without blocking the stream and are happy being submerged for periods of time. Plant flaxes and larger shrubs and trees further back on the stream banks where the water is less frequent. Flaxes can block stream flow and cause erosion if they are too close to the edges. Over time, more fern species and shrubs will naturally fill in the edges of the forest streams.



Before/after photos
by Stu Farrant,
Mt Victoria



Kaiwharawhara
Stream edge in
good condition with
an overhanging
canopy and ferns



(Above) Carefully
consider the
placement of grasses
and flaxes before
planting. Flaxes
especially can cause
more damage by
blocking streams in
high flows, causing
more erosion.
Always plant sedges
that bend with the
water flow on the
stream banks closest
to the water.



(Below) Water celery
and monkey musk
taking over the
restoration planting
at Karori Stream.
Both these weeds are
difficult to eradicate.

Plant list for freshwater stream edges

Stream edges		Site type		Plant type	Plant preferences & tolerances				Abundance	
Māori/ Comon name	Botanical name	Streams in the open	Streams in forests	Plant type	Soil moisture needs	Light levels	Frost tolerant	Wind tolerant	Early stage	Later stage
Rautahi Cutty grass	<i>Carex geminata</i>	•		Sedge	Wet	Sun	✓	✓	++	
Hook grass	<i>Carex uncinata</i>		•	Sedge	Semi-moist	Shade	Moderate	Moderate	++	++
Kawakawa	<i>Piper excelsum</i>		•	Shrub	Semi-moist	Shade	Frost tender	Needs shelter	+++	++
Kiokio	<i>Parablechnum novae- zealandiae</i>		•	Fern	Semi-moist	Semi- shade	Moderate	Moderate		+
Kōtuketuku/ Tree fuchsia	<i>Fuchsia excorticata</i>		•	Tree	Semi-moist	Semi- shade	✓ When mature	Needs shelter		++
Pūrei	<i>Carex secta</i>	•		Sedge	Wet	Sun	✓	✓	+++	
Rautahi/ cutty grass	<i>Carex lessoniana</i>	•		Sedge	Semi-moist to wet	Sun to semi- shade	✓	✓	++	
Pūkio/ swamp sedge	<i>Carex virgata</i>	•		Sedge	Wet	Sun	✓	✓	+++	
Toetoe	<i>Austroderia fulvida</i>	•		Grass	Semi-moist	Sun	✓	✓	+++	
Umbrella sedge	<i>Cyperus ustulatus</i>	•		Sedge	Semi-moist to wet	Sun	✓	✓	++	

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



“Sedges love the edges.”
Tim, Wellington City Council

Community
planting day, upper
Kaiwharawhara
Stream, restoring
the stream bank
with a mix of trees,
shrubs and grasses.