

# Wetlands facts 02

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

Wetland ecosystems are under threat in New Zealand with less than 10 per cent remaining.

## Do you want to help restore and protect these unique ecosystems?

You may wish to create or restore a wetland to encourage native plants and wildlife, to maintain water quality or for aesthetic reasons. With all restoration efforts, the aim should be to keep it simple. The goal should be a wetland that takes care of itself with little effort from you.

This factsheet provides a guide to restoring wetlands in the Auckland Region. It includes useful planting tips and a guide to what to plant, where and how. It also includes lists of plants suitable for planting in wetlands in the Auckland region.

We hope this guide will provide you with the information you need and, most importantly, with inspiration and motivation!

Protect. Restore. Connect.



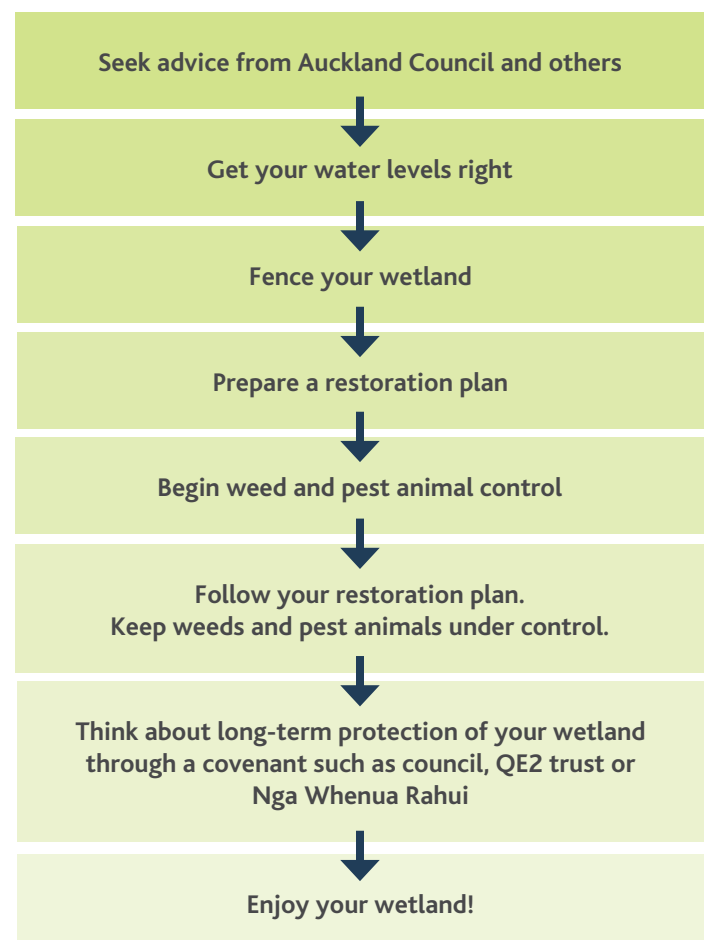


## Important things to consider

- Fencing – keep stock out of the wetland. Often putting a fence around a wetland is all you need to do. Nature will do the rest!
- Restore the edges of the wetland with a buffer of native plants. This buffer planting will help to protect the wetland, act as a filter for runoff from surrounding land and provide habitat for wetland birds.
- Restore natural water levels and flows. Most native wetland plants should come back themselves once natural water levels are restored and stock are excluded. Check for any artificial obstructions to the passage of native fish. It is important that any major work, such as removing drains or artificial obstructions e.g. culverts, is done before any restoration planting is undertaken, so that new wetland plants can establish and then be left to adapt naturally to the water levels in the wetland. Artificial drains can also be left to silt up over time, and water flows encouraged to find their natural path. You may need a Resource Consent if you are doing any works in a watercourse or wetland. Seek advice from the Auckland Council about consent requirements and allowing for fish passage.
- Control weeds and pests such as willow - the Auckland Council biosecurity team can provide further advice. (See end of this brochure for contact details)
- The aim is to restore natural wetland systems. The creation of artificial ponds and open water bodies is not recommended. They can be difficult to keep free of weed and algae in summer and their growth may block fish access. Most native birds prefer swampy areas with rushes, raupo or flax rather than deep open water.
- Talk to your neighbours. Let them know what your plans are. Maybe you can each work on sites that can then be linked to increase the area of wildlife habitat and provide wildlife corridors.

## Follow the flowchart below to find out how to do it...

Decide what you want and what suits your situation- look at what is growing in other wetlands around your area



**Huutia te rito o te harakeke kei hea he korimako e koa**

**“Pull out the young shoot of the flax and where will the bellbird sing”**



## What are wetland plants?

Wetland plants are adapted to living with wet feet. Many have special adaptations such as buttress roots, hollow stems and aerial roots to cope with anaerobic soil conditions. Different species of wetland plants are adapted to living with different water level tolerances. For example, raupo, kuta, *Machaerina articulata* and kāpūngāwhā are adapted to living in standing water and on the edges of stream channels and lake edges. Other species such as *Machaerina rubiginosa* and *Juncus edgariae* will grow around the swampy margins or in swamps with lower water levels. Wetland species adapted to saline environments include oioi, salt marsh ribbonwood, mangroves and sea rush. Other species will grow in brackish areas, at the interface between salt and fresh water, e.g. marsh club rush and *Machaerina juncea*. Wetland plants are very adaptable and many will regenerate naturally if water levels are right and stock grazing pressure is removed from an area. You will be surprised how quickly a wetland can recover with a little care.

## Preparing a restoration planting plan

The following guide provides ideas on what to plant in a wetland. Before preparing a restoration plan you need to assess what is already there and decide what needs to be planted. All you may need to do is fence the wetland and then let it restore itself naturally.

### Some check points:

- Refer to the species lists given in this fact sheet and check the tolerance limits for each species.
- Choose plants characteristic of your wetland. Look at other wetlands in your area to see what grows there. Be aware that some of the plants may be plant pests, or may have been planted but do not naturally occur in the area. Contact the Auckland Council for advice on plant pests.
- Buy native plants from nurseries that source plants from your district, to ensure they are suited to your area's climate and soils

- You may be able to grow some of your plants from seeds taken from neighbouring wetlands – always seek permission before taking any plant material.
- Refer to Auckland Council's Riparian Zone Management Guidelines (TP148) for further information.

## Timing

Depending on soil moisture, in many parts of Auckland you can plant throughout autumn, winter and spring. Concentrate on establishing coloniser vegetation first with species such as manuka, flax and cabbage trees. These plants will act as a nurse crop to shelter other species that can be planted later, or that will establish naturally (e.g. kahikatea, pukatea, putaputawētā, kōwhai, tree ferns and nīkau). If your area is susceptible to frosts, plant frost sensitive species in spring.

Plant wetland species that grow in standing water and swampy ground at the end of summer, when the water levels are low.



Cabbage tree foliage



## Site preparation and planting

1. The most important thing is to fence your site prior to planting. Remember that many native plants are vulnerable to stock grazing.
2. Clear away grass and weeds around each planting site to ensure the new plants get enough light and nutrients.
3. Set plants out in sites suitable to their growing requirements leaving space for them to grow. Ferns, rushes and small sedges can be planted 50cm apart. Larger plants can be placed 1m apart. Large tree species (e.g. kahikatea) need more room – plant them 5m apart in amongst nurse species.
4. Plan your planting in small stages – it is easier to maintain smaller areas.
5. Dig a hole larger than the plant container. Loosen the soil at the bottom of the hole, to allow the roots to penetrate the soil more easily. Place the plant in the hole, gradually add soil to the hole and firm the soil well around the plant after the hole is filled.
6. Form a hollow around the base of the plant to trap rainfall on dry sites. Give the plants and surrounding soil a good watering and remember to water young plants over dry spells.

Staking the plants at this stage will make them easier to locate later. Tall, thin bamboo stakes highlighted with spray paint are ideal.

Refer to the Auckland Council Riparian management guidelines, the Good Start Guide and other Auckland Council fact sheets on restoration planting for more information.

## Width of riparian planting

A 10m minimum riparian buffer width either side of a stream or wetland system is recommended.

However, this will be dependent on the practicalities of your site. Refer to the Auckland Council riparian management guidelines (TP 148) for further information.



**Clear all weeds from your planting site. Dig a hole deeper and larger than the root ball of your plant**



**Place the plant in the hole and fill the hole with soil to the height shown above. Press gently around the plant.**



**Water well because a good soak will help the plant to get established**



**Put mulch, compost and/or bark chips around the plant, not touching the stem.**

## More planting tips

- For a higher chance of survival, use larger plants. They are also less likely to be uprooted by pūkeko.
- Set your plants out in groups. The plants will soon shelter each other and begin to shade out surrounding weeds, making your job easier. More plants can be added to the edge of your planting as time and resources permit.
- In poor soils, a slow release fertilizer can be added.
- On dry sites, mulch around the plants will help conserve water, keep weeds down and provide nutrients.
- Ensure mulch, plants and their soil and containers are free from contaminants e.g. weeds, Argentine ants and rainbow skink eggs.
- Fast growing plants such as mānuka, kānuka, karamū, cabbage trees and flax can be used as nurse plants to provide shade for seedlings underneath.
- You may find native plants popping up on their own once the stock has been removed from the site. Plants like flax attract birds such as tūī, and they will bring seeds of other species into the site for you.
- Most plants listed as tolerant of standing water, including rushes and sedges, kahikatea, cabbage trees, swamp maire and pukatea, must first be planted in moist conditions before becoming flooded. The best time to plant these species is near the end of summer, when water levels are lowest. This is particularly important for nursery raised plants that have not been subjected to waterlogged conditions.

- If your site is very wet you can build low (20-30 cm) mounds to plant the young plants on. This will keep their roots above water until they have become used to the local conditions.
- After 3-5 years, your plantings should take care of themselves and you can sit back and enjoy your wetland.
- Keep a photographic record as you go to remind yourself how much you've achieved.

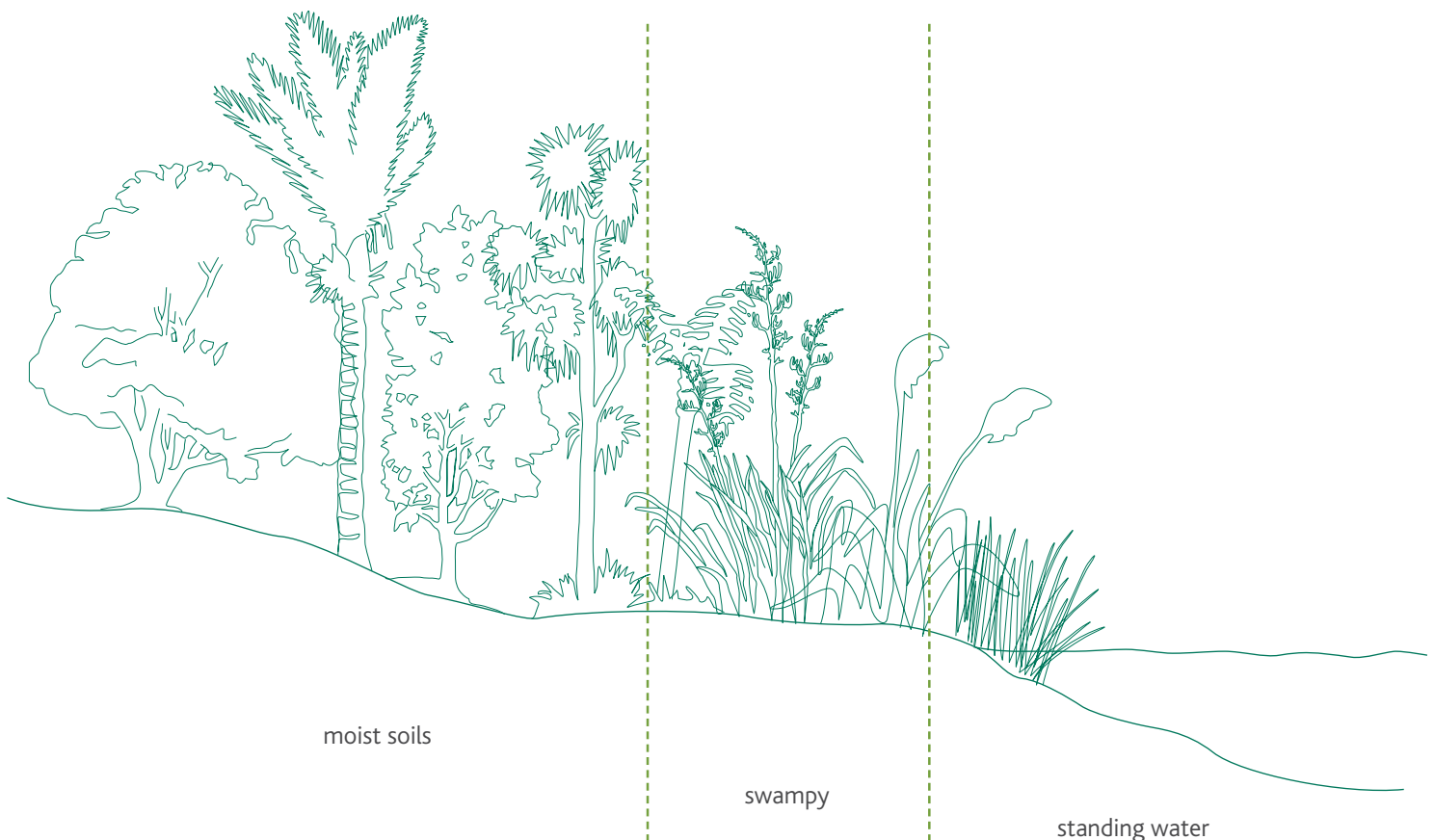
## What to plant & where?

The following lists provide a guide to the typical plant species that live in and on the edges of wetlands in the Auckland Region. It also provides a general guide as to what to plant and where.

The lists have been divided into different zones around a wetland, depending on the distance from the edge of areas of open water and on the depth of the water table. A separate list is also provided for saline (saltmarsh) wetlands. Different wetland plant species are adapted to living in these different zones. These zones can be identified as:

- Moist soils around the edge of wetlands and in riparian zones.
- Swampy areas with temporary flooding.
- Standing water - where water lies above the soil surface for much of the year.

It should be noted that wetlands do not always have areas of open water. Some wetlands may only be temporarily wet, e.g. over winter.







Exotic pampas grass

**If you are restoring an existing wet area you may not need to plant many wetland species. Wetland plants will often establish naturally once water levels are restored and stock is removed. Nature will work its own magic!**

Site specific information on soils, topography, what is growing in the local area and historical information on what would have originally grown there, can be useful when developing a restoration plan. Contact the biodiversity team at the Auckland Council for information and advice.

Auckland Councils Riparian Zone Management Guidelines (TP148) provide excellent information and planting lists for stream banks and the edges of wet areas. A riparian buffer will help to protect your wetland.



Possum

## Weeds and pests

Maintain plantings by clearing weeds around them for 3-5 years until your plants are well established. Pests such as rabbits and possums will need to be controlled, particularly during the seedling stage.

To find out more about weeds and pests, contact the Auckland Council's biosecurity team on 09 301 0101 or check out the information available on the Auckland Council website [www.aucklandcouncil.govt.nz](http://www.aucklandcouncil.govt.nz).

## Planting guides for wetland areas

### Species abundance

The species 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. (+++use plentifully, ++use commonly, +use sparingly)

### Moist edges

Maori name/ common name	Scientific name	Type of plant	Abundance	Tolerances
			(+++ use plentifully, ++ use commonly, + use sparingly)	
toetoe	<i>Austroderia fulvida</i>	1.5m grass	+++	Native toetoe (not pampas). Coloniser. Damp and dry soils, can grow on poor soils.
harakeke, flax	<i>Phormium tenax</i>	2m monocot clump former	+++	Very hardy. Tolerates wet and dry soils. Forms large clumps.
mānuka	<i>Leptospermum scoparium</i>	4m tree	++	Grows vigorously and has a wide ecological tolerance, including the ability to colonise inhospitable, low fertility sites and the lower slopes along brackish streams. Needs to be planted in autumn with minimal root disturbance during planting.
rautahi	<i>Carex germinata</i>	1m sedge	++	Along river and stream banks, lake margins, and in damp seepages.
purei, mākura	<i>Carex virgata</i>	1m sedge	++	Swampy conditions and also in damp sites within lowland forest.
cabbage tree, tī kōuka	<i>Cordyline australis</i>	8m tree	++	Tolerates wet and dry soils. Hardy.
koromiko	<i>Hebe stricta var. stricta</i>	2m shrub	+	Very hardy. Fast growing colonising native shrub species, fibrous roots reduce erosion. Possum hardy.
kawakawa	<i>Macropiper excelsum</i>	2m shrub	+	Common understorey species in coastal forests and riparian areas. Frost tender, likes sun or shade.
patē	<i>Schefflera digitata</i>	3m tree	+	Grows rapidly in damp shaded sites. Highly palatable to possums & rabbits.
karamū	<i>Coprosma robusta</i>	3m shrub	+	Fast-growing shade tolerant species. Can be used as a nurse crop. Coloniser.
putaputawētā	<i>Carpodetus serratus</i>	3m tree	+	Grows in swamp forests and riparian areas.
kōwhai	<i>Sophora microphylla</i>	6m tree	+	Fast growing, semi-deciduous. Can be grown from seed. Useful for erosion control. Flowers attract birds.

Moist edges table continued

Maori name/ common name	Scientific name	Type of plant	Abundance	Tolerances
māhoe	<i>Meliclytus ramiflorus</i>	7m tree	+	Best planted in autumn. Common in young riparian vegetation throughout the region. Very fast growing once established. Good nurse crop and excellent for erosion control.
nikau	<i>Rhopalostylis sapida</i>	10m palm	+	Grown from seed. Slow to germinate. Wind sensitive.
pukatea	<i>Laurelia novae-zelandiae</i>	30m tree	+	Slow growing. Tolerates wet sites and periodic flooding.
kahikatea	<i>Dacrycarpus dacrydiodes</i>	30m tree	+	New Zealand's tallest tree. Plant with shelter in a moist site.

Boggy/swampy areas

Maori name/ common name	Scientific name	Type of plant	Abundance	Tolerances
			(+++ use plentifully, ++ use commonly, + use sparingly)	
rushes, wiiwii	<i>Juncus edgariae</i>	0.5m sedge	++	Swampy ground.
toetoe, upoko tangata	<i>Cyperus ustulatus</i>	0.8m sedge	++	Open damp places, may grow in 10cm of standing water, coastal and lowland.
rautahi	<i>Carex geminata</i>	1m sedge	++	Lowland swamps.
purei, makura	<i>Carex secta</i>	1m sedge	++	Shallow open water, swampy areas.
purei, makura	<i>Carex virgata</i>	1m sedge	++	Swampy areas.
rushes, wiiwii	<i>Juncus sarophorus</i>	1-2m tall rushes	++	Swampy ground.
swamp kiokio	<i>Blechnum minus</i>	0-5m fern	+	Tolerates some frost and sun. Not tolerant of wind. Found in flax and sedge swamps and under manuka scrub.
waewae kotuku, tangle fern	<i>Gleichenia dicarpa</i>	sedge	+	Low fertility damp wetlands, often with manuka.
clubrush	<i>Isolepis prolifer</i>	0.5m fern	+	Edges of pools, streams, swamps.
	<i>Machaerina rubiginosa</i>	0.9m sedge	+	Swamps, bogs, lake margins.
sharp spike sedge	<i>Eleocharis acuta</i>	0.9m sedge	+	Stream margins, swampy areas.
toetoe	<i>Austroderia fulvida</i>	1.5m grass	+	Native toetoe (not pampas). Coloniser. Damp and dry soils, can grow on poor soils.
marsh club rush, kukuraho, pūrua	<i>Bolboschoenus fluviatilis</i>	1.5-2m tall sedge	+	Margins of streams, swamps, mainly coastal.
tūpari maunga	<i>Gahnia xanthocarpa</i>	2-3m tussocky	+	Leaves very harsh. Lowland bogs, swamp forest.
putaputawētā	<i>Carpodetus serratus</i>	3m tree	+	Grows in swampy ground, riparian areas.
swamp coprosma, hukihuki	<i>Coprosma tenuicaulis</i>	3m shrub		Found in bogs or swamps, its black fruit attracts birds.
cabbage tree, tī kōuka	<i>Cordyline australis</i>	8m tree	+	Tolerates wet and dry soils. Hardy.
pukatea	<i>Laurelia novae-zelandiae</i>	30m tree	+	Slow growing. Tolerates wet sites and periodic flooding.
kahikatea	<i>Dacrycarpus dacrydiodes</i>	30m tree	+	New Zealand's tallest tree. Plant with shelter in a moist site.
mānuka	<i>Leptospermum scoparium</i>	4m tree	+	Grows vigorously and has a wide ecological tolerance, including the ability to colonise inhospitable, low fertility sites and the lower slopes along brackish streams. Needs to be planted in autumn with minimal root disturbance during planting.
flax, harakeke	<i>Phormium tenax</i>	2m	++	Very hardy. Tolerates wet and dry soils. Forms large clumps.
maire tawake, swamp maire	<i>Syzygium maire</i>	30m tree	+	Red berries, develops breathing roots in waterlogged soils.

Standing water

Maori name/ common name	Scientific name	Type of plant	Abundance	Tolerances
			(+++ use plentifully, ++ use commonly, + use sparingly)	
purei, makura	<i>Carex virgata</i>	1m sedge	++	Swampy areas.
purei, makura	<i>Carex secta</i>	1m sedge	++	Shallow open water, swampy areas.
bamboo spike sedge, kuta kuta	<i>Eleocharis sphacelata</i>	1m sedge	++	Grows in up to 0.5m water, margins of lakes, open water.
jointed twig rush	<i>Machaerina articulata</i>	1.8m sedge	++	Grows in 0-30cm of water, around edges of dune lakes, streams and open water.
kāpūngāwhā, lake clubrush	<i>Schoenoplectus tabernaemontani</i>	1-2m sedge	++	Margins of lowland lakes, streams and ponds, both freshwater and brackish. Grows in shallow water.
toetoe upoko tangata, (giant umbrella sedge).	<i>Cyperus ustulatus</i>	0.8m sedge	+	Open damp places, may grow in 10cm of standing water, coastal and lowland.
	<i>Typha orientalis</i>	1-3m herb	+	Grows in up to 1m depth of water, edges of lakes and streams, swampy areas.

## Saline (saltmarsh) Wetlands

Maori name/ common name	Scientific name	Type of plant	Abundance	Tolerances
			(+++ use plentifully, ++ use commonly, + use sparingly)	
oioi, jointed wire rush	<i>Apodasmia similis</i>	1.5m rush	+++	Bordering saltmarshes and estuaries, or in dune hollows on coast. Distinctive grey/green, orange, purple, rainbow colouring.
knobby clubrush	<i>Ficinia nodosa</i>	0.5m rush	++	Coastal banks, dunes, sometimes wet ground.
saltmarsh ribbonwood, maakaka	<i>Plagianthus divaricatus</i>	2m shrub	++	Coastal, along margins of salt marshes and estuaries near top of tidal range, in dune hollows and coastal gravels.
	<i>Machaerina juncea</i>	1m sedge	+	Coastal areas, lowland swamps, saltmarsh.
sea rush	<i>Juncus kraussii</i> var. <i>australiensis</i>	1m rush	+	Damp sand, saltmarsh and estuary margins.
marsh clubrush, kukaraho, purua	<i>Bolboschoenus fluviatilis</i>	1.5m sedge	+	Margins of coastal streams, brackish water.
coastal tree daisy	<i>Olearia solandri</i>	2m shrub	+	On edges of saltmarsh.
harakeke, flax	<i>Phormium tenax</i>	2m monocot clump former	+	Throughout lowlands, swamps and many other open habitats, coastal areas.
mānuka	<i>Leptospermum scoparium</i>	4m tree	+	A very widespread shrub, coastal to subalpine in many habitats, dry to wet, often fringing lakes, in swamps and bogs. An important coloniser in many plant successions.

## Other Auckland Council factsheets and guidelines

- Coastal planting guide 5 -coastal wetlands, saltmarshes and estuaries
- Wetlands facts 01
- Streamside planting guide
- Auckland Council riparian zone management guidelines, (TP148)
- Auckland Council fish passage guidelines, 2000 (TP131)
- The good start guide – planting guide for volunteers
- Voluntary protection on private land of natural areas

## Need more information?

The Auckland Council's biodiversity team can provide further information on ecological restoration contact us on 09 301 0101. Many of the native plants listed in the wetland planting guide are on display at the Auckland Botanic Gardens in Manurewa. Please feel free to visit the gardens to familiarise yourself with these plants.

The Auckland Council can provide further information on ecological restoration, pest plants and animals, consent requirements and funding opportunities. Contact Auckland Council 09 301 0101 or visit [www.aucklandcouncil.govt.nz](http://www.aucklandcouncil.govt.nz)



Giant Kokopu, native fish

