

Looking after your wetland





If you have a wetland on your property and are interested in looking after it, this guide is for you.

Read on and you'll find out how to restore wetlands – whether as a habitat for native plants and animals, as an attractive part of your property, or as a way to clean up your water supply.

If you're interested in creating a new wetland, this guide may also provide some useful pointers.

Contents

Wetland wise

What is a wetland?	2
Why wetlands are important	2
Wetland types in the Northland region	3
Unique wetland wildlife	4



How do I restore a wetland?

Look, learn and plan	9
Investigate the water supply	10
Keep stock out	11
Control the weeds	12
Control animal pests	13
Provide 'extras' for wildlife	14
Start planting	15
Looking after your plants	16
Monitor your progress	17
Protect your investment	17
A guide to plants for wetlands in Northland	18
Wetland rules	20



Contacts for more information

21

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The guidelines include material developed by Greater Wellington Regional Council and Waikato Regional Council (used with permission).

Printed on Mohawk® Options which is produced using FSC® Certified, 100% Post Consumer Recycled, Process Chlorine Free (PCF) pulp.

Design and production by CALDERS, Whāngārei.

First published by the Northland Regional Council February 2005, updated February 2009, reprinted April 2013.



Wetland wise

What is a wetland?

The term 'wetland' covers habitats where the land is covered in, or saturated by, water for at least some of the time.

Wetlands occur in areas where surface water collects or where underground water seeps through to the surface. They include swamps, bogs, marshes, gumlands, saltmarshes, mangroves and some river, lake and stream edges.



Why wetlands are important

In the past, many people did not recognise the true value of wetlands and consequently nearly all of them have been converted to pasture or urban use. Wetlands help prevent flooding and improve water quality, as well as providing the necessary habitat for a number of unique species of plants and animals. Conserving and restoring wetlands will provide many benefits to the wider environment.

A giant 'sponge'

Wetlands act as a giant sponge, helping to soak up water and improve water quality. Plants in wetlands slow the flow of water off the land so that, in times of flood, more can be absorbed into the soil and taken up by the plant life. In summer, stored water is slowly released from wetlands, maintaining water flows.

Overseas studies have found that peak flood levels can be reduced by 60-80% in catchments with one third of their area in lakes or wetlands.

Cleansing the system

Bacteria in wetlands' damp soils contribute to cleaner water by absorbing and breaking down about 90% of the nitrogen contained in farm run-off (such as in fertilisers, chemicals and animal wastes). This cleaner water prevents nuisance algal blooms and is better for livestock and wildlife. Plants also trap waterborne sediment, preventing silt entering streams and harbours.

A food source

Wetlands are among the most productive places on Earth, providing an enormous food source for fish, birds and other animals. They absorb large amounts of water and nutrients from outside sources and contain micro-organisms (fungi and bacteria) which efficiently decompose and recycle nutrients.

A cultural treasure

Wetlands are also important to Māori, featuring in the history and culture of many hapū. Wetland plants are traditional materials for clothing, mats, medicine and dyes. Wetland animals, especially tuna (eels), are valuable food sources.

Wetland types in Northland

The Northland region has eight main types of wetlands:

- Bogs
- Swamps
- Marshes
- Ephemeral (seasonal) wetlands
- Fens
- Gumlands
- Salt marshes
- Seepages

Bogs

Bogs are very rare and precious in the Northland region. Fed only by rainfall, they are low in fertility and are acidic. They are home to a variety of specialist plant life, with the wettest dominated by sphagnum moss. In Northland, bogs are home to the nationally threatened mudfish species. Drier bogs support a variety of plants including sedges, rushes, umbrella ferns and manuka.

Fens

These are the rarest type of wetland. They are largely infertile, like bogs, but because they also receive runoff from surrounding land, they have areas of fertility. They usually have higher biodiversity than other wetland types.

Salt marshes/coastal wetlands

Estuaries (including salt marshes and mangroves) are the most productive of all wetlands and are especially rich in animal life. Many coastal fisheries depend on estuaries as fish spawning grounds.



Peat bog

NRC Photo



Fen

Doc Photo



Salt marsh

NRC Photo



Swamp – reedland

NRC Photo



Seepage

NRC Photo

Swamps

Most wetlands on private land are swamps. They are fertile because they receive runoff from surrounding land which brings silt and organic matter. Swamp water levels fluctuate seasonally and most swamps are in valley bottoms.

Typical swamp plants include raupo, purei (Carex sedges) and harakeke (flax). The organic matter these plants produce encourages large populations of aquatic invertebrates and birds.



Dune lake

NRC Photo

Shallow water – lakes, ponds, dune lakes and rivers

Open water is not strictly a wetland type, but it is often associated with shallow water margins surrounded by wetland vegetation. These areas are important water bird and native fish habitat.

Northland is home to more than 400 dune lakes. These lakes within old sand dune systems are often dynamic, with fluctuating water levels and shorelines that are often being changed by shifting sand dunes. Dune lakes are home to a large diversity of native plants and animals, including the rare freshwater fish, the dwarf inanga, which is only found in some dune lakes in Northland.

Northland has some of New Zealand's most pristine dune lakes. Dune lakes, especially on the Poutō Peninsula, are often associated with huge marsh wetlands.



Marsh

NRC Photo

Marshes

These are on flood plains associated with rivers, or next to lakes. At times they are flooded and at other times they are dry. Marshes sometimes have tall trees such as kahikatea, swamp maire and pukatea which have adapted to living with their roots in water-logged soil.

Gumlands

Gumlands may not appear to be wetlands as they are at the top of hills and are dry most of the time. However, hard pan soils formed under old kauri forests mean that the drainage is very poor, so they are wet in winter. They contain unique shrubland communities and, because they are infertile, share many species with bogs. These are very rare now as most have been cleared or developed.



Gumland

NRC Photo

Seepages

These are places on slopes where water comes to the surface, often as small springs. They are common, but are seldom fenced, looked after or appreciated.

Ephemeral wetlands

Seasonal or ephemeral wetlands are areas where water ponds in winter and dries up in summer. This gives rise to short, turf-like vegetation. The most common ephemeral wetlands are in coastal dunes where they are known as dune slacks.

Unique wetland wildlife

Wetlands support an immense variety of animals, some of which are very rare.

Most of New Zealand's wetland animals are not found anywhere else in the world. They include fernbirds, New Zealand dabchicks, New Zealand scaup and paradise shelducks. Mudfish are also unique. Pateke (brown teal) are now restricted to two small populations on the east coast of Northland and Great Barrier Island.

Animals that can only live in wetlands face an uncertain future through habitat loss and/or damage. Many, like the Australasian bittern, pateke and short-jawed kokopu, are now endangered. Conservation and restoration programmes help to provide the habitat they need and ensure these wildlife survive into the future.

Wetland birds

The size and diversity of wetlands in an area determines the diversity of birdlife that can be supported. The pie graph shows the kinds of habitat some wetland birds need.



Spotless crane among raupo

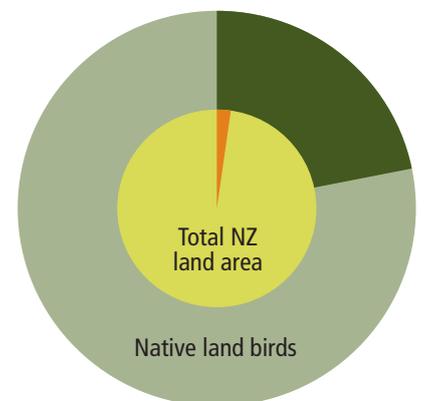


Large native dragonfly

Department of Conservation Photo

Wetlands now cover less than 2% of New Zealand's land area, but are home to 22% of our native land bird species.

- Native wetland birds
- Wetland area in New Zealand



Ephemeral wetland in coastal dune

MBC Photo

	Bird	Habitat requirements
	Spotless crane, marsh crane and Australasian bittern	These secretive birds feed in permanently shallow water under flax and other wetland plants. They build nests under sheltering sedges, such as purei and occasionally among stands of shrubs, such as manuka.
	North Island fernbird	Fernbirds prefer wetlands with dense ground cover under a selection of shrubs and small trees like manuka. Northland is the stronghold for fernbirds.
	Pied stilt	Pied stilts feed on worms and insects in temporary winter pools in paddocks and permanent wetlands. They nest in scattered clumps of rushes.
	New Zealand scaup	New Zealand scaup prefer deep, open and clear water with abundant invertebrates (insects, worms and snails). They nest in dense wetland vegetation such as raupo and purei.
	Grey duck, New Zealand shoveler and grey teal	These birds prefer shallow water around the edges of a pond or lake. They need open water to moult in safety, away from predators.
	New Zealand dabchick and Australasian little grebe	New Zealand dabchick and Australasian little grebe feed in deep, open water but build their nests on floating rafts of vegetation among reeds.
	Tui, waxeye and kukupa	These birds visit wetlands at certain times to feed. Tui and waxeye feed on nectar-producing plants like harakeke (flax). Kukupa (wood pigeons) visit wetlands to feed on fruiting trees like kahikatea.
	Pateke (brown teal)	The endangered pateke feed in damp, short pasture, and in seepage areas, shallows of ponds and estuaries. They nest among dense clumps of sedges and rushes, usually near water. Pateke prefer to roost beside the deep water of ponds, streams or estuaries, usually beneath large trees.

All Department of Conservation Photos

Focus on fish

Many of New Zealand's native freshwater fish live in wetlands for some or all of their lives – such as short-fin and long-fin eels, inanga and banded kokopu. These fish also journey to and from the sea using a corridor of estuaries, rivers, streams and drains. This watery pathway must be kept intact if they are to complete their lifecycles successfully.

In contrast, the black mudfish and endangered Northland mudfish spend all their lives in wetlands, drains or weed-filled creek beds. During dry spells, they have an extraordinary ability to burrow deep into mud or under logs and hibernate for months at a time. This means they can occupy seasonal wetlands not accessible to other fish.



Eel

MVA Photo



Banded Kokopu

Reuben Strickland Photo



Koura

MVA Photo

Whitebait

The juveniles of many of our native fish, such as banded and short-jawed kokopu, inanga and koaro – are collectively known as "whitebait". Their eggs hatch in autumn and the larvae are washed out to sea. Six months later they make the hazardous return journey as juveniles. Most of the whitebait fishery catch is inanga.

Juvenile kokopu and koaro can travel large distances upstream, even climbing damp rocks beside steep waterfalls, until they reach sheltered streams and wetland habitats.

Insects and other creatures

Although birds are the most visible component of wetlands, other animals like invertebrates (such as insects, snails, crustaceans and worms), amphibians (frogs) and reptiles (lizards, etc) also live there. Typical wetlands can have hundreds of rarely seen insect species, all of which form an integral part of the food web.



Frog

George Skuse Photo



Native leech in dune lake

MVA Photo

How do I restore a wetland?

All wetland restoration work should be as simple as possible. Your goal is a wetland that takes care of itself with little input from you.

The steps that follow are a general guide for swamp restoration (estuaries and peat bogs will have different management needs). Please make sure you seek advice if you are restoring a bog, fen or salt marsh. Each wetland is unique, so some steps may not be necessary in your situation. We recommend you seek professional help for detailed information and advice. There is a list of contacts at the back of this booklet.

Under Northland Regional Council rules, you cannot undertake works within or near a significant indigenous wetland as they could cause adverse effects. This includes building structures, drainage, clearing or excavating. Please seek advice before you start work, as most wetlands in Northland are classed as 'significant'. Check that you do not require a resource consent before you start work in your wetland.

- 1** Look, learn and plan. Consider the wetland type, what you want to achieve and what suits your situation. Seek advice and take your time.
- 2** Investigate the wetland's water supply. If water levels and flows need restoring, this will be your first step. Many wetlands become dry and weedy because of drainage on adjacent land. You may need to manage a drain or culvert to restore water. Seek advice first as you may need a resource consent (see section 11, Wetland rules).
- 3** Keep stock out, particularly at critical times of the year. However, be aware that if there is a nearby population of pateke (brown teal), they will benefit from some adjacent pasture being grazed.
- 4** Control weeds.
- 5** Control animal pests.
- 6** Consider providing 'extras' for wetland wildlife.
- 7** Plant in and around your wetland, focussing first on replacing species which have been removed or grazed out. See the planting guide at the end of this booklet for plants to use for the different wetland types.
- 8** Maintain the area with weeding and pest control.
- 9** Monitor your progress.
- 10** If you wish to protect your investment of time and energy, you can place a covenant on the site – where you or subsequent owners retain ownership and control, but the wetland is protected forever.
- 11** Know and comply with rules about wetlands.

1 Look, learn and plan

No two wetlands are alike – how they look and the plants and animals they contain will vary with local conditions (e.g. soils, climate and water flow). Larger wetlands may contain several different types of plant and animal communities, and all wetlands change with environmental conditions.

Before you start restoring your wetland, develop a site plan and ask yourself:

- What's there now? Plan to protect and encourage any naturally occurring native plants first.
- What was there originally? Look at wetlands of a similar type in the area. Stock may have grazed out species such as cabbage tree, flax and raupo. Restore these "missing elements" first.
- What would you like to see in the future?
- What are your aims? Trapping sediment? Attracting wildlife? A water source?
- How much time and what resources do you have?
- What effect will your activities have on neighbouring properties, both upstream and down?
- Could you work with neighbours?
- Is your wetland changing? Check out the water supply. Your wetland may be getting wetter or drier depending on what you or your neighbours are doing.
- Are you going to be doing any works that may cause damage or effects in the wetland? If so, you will need a resource consent.

Seek advice and help

Talk to the Northland Regional Council and the groups listed at the back of this guide about your goals. They can advise you on what to plant and options for funding. The Northland Regional Council may be able to provide copies of aerial photographs, if staff time allows.

See *Waikato Regional Council's wetland restoration template* – www.waikatoregion.govt.nz – and *Landcare Research's Green Toolbox Species Selector* – www.landcareresearch.co.nz/resources/tools/green-toolbox



Aerial photographs are an excellent planning tool

NRC Photo



Taikirau Swamp - a larger wetland with multiple owners

NRC Photo



Fenced swamp near Whāngārei

NRC Photo

2 Investigate the water supply

Your wetland and its water

Wetlands are covered or soaked for at least part, and often all, of the year. They depend on a natural supply of water – from tidal flows, springs, streams, flooding rivers, connections with groundwater, rainfall or a combination of these.

The water level in your wetland and how much it fluctuates will determine the plants and animals it can support.

Before you decide what sort of approach should be taken, spend some time monitoring the source and amount of water, especially over the seasons. Use a 'depth marker' (such as a wooden post) to mark water levels at different times of the year and use stakes to mark the edges of the winter water levels and summer water levels. This will help you decide if the water levels need restoring, what to plant and where. When wetlands become drier, weeds such as gorse, Mexican devil weed and pampas move in. Restoring water levels can help manage these weeds.

A number of things can damage a wetland's natural cycle of flooding and drying. They happen at two key places:

- At the "wetland" level, the cycle can be affected by drainage (including the construction of drainage ditches and culverts) or filling and levelling of low-lying areas.
- At the "catchment" level (the source of the wetland's water), the cycle can be affected by fewer floods than normal (if rivers are stopbanked), water takes from streams and groundwater, and the drainage of nearby wetlands.

If the wetland has been partially drained, you'll probably need to increase its water levels by filling in or blocking ditches or drains. Weirs are an effective way to manage water levels, but require a resource consent. If there have been changes within the catchment you may need to increase water levels by building a low bund, weir or dam, or other earthworks.

Before you make any changes to water levels in a wetland or undertake any earthworks, contact the Northland Regional Council and your district council, as you will need a resource consent.



Monitoring water levels

NRC Photo



Water levels are important

NRC Photo



Raising water levels may kill vegetation around edges.

Bruce Griffin Photo



D&C Photo

Creating areas of open water

It's not a good idea to create areas of open water by excavating material out of, or damming, existing wetlands. Areas of open water can be difficult to keep free of weed and algae in summer and dams can block fish access. Often wetlands do not have sufficient water flow to support good ponds. Seek advice before you create a pond.

Avoid damming or excavating wetlands that have not been disturbed and that support native plants and animals. If you want to create open water, choose bare paddocks or badly degraded wetland areas. And make sure you create some gently sloping, irregular shorelines as well as areas of water three metres deep. This allows birds, particularly waders, chicks and ducklings, easy access to and from the water and will extend the belt of reeds and rushes growing around the edge. Fallen trees and stumps can provide good roosts.

You may require a resource consent for this work, so check first with your district council and the Northland Regional Council.

3 Keep stock out

Stock that venture into wetland areas will increase the soil's nutrient levels, pug (compact) the soil, cause erosion, disturb the wildlife and eat and trample wetland plants. Cattle, in particular, tend to gather near water and wade into it. Stock grazing over time can completely change the vegetation type of a wetland.

Fencing stock out will encourage plants to regenerate from natural seed sources, prevent stock getting trapped and, in some areas, may reduce the incidence of liver fluke. If you can, aim to exclude not just the wetland itself, but also a buffer strip of 10-12 metres around it. A two or three wire electric fence may be sufficient for cattle.

If you don't wish to keep stock out for the whole year – for example, if you want to keep surrounding plants cropped short for feeding waterfowl, such as pateke and pied stilt – it's better to graze a small number of sheep as they are less likely to enter water, pug soil or ring-bark trees. The best time is mid-summer to mid-autumn, as your wetland will be drier and most bird breeding activity will be over.

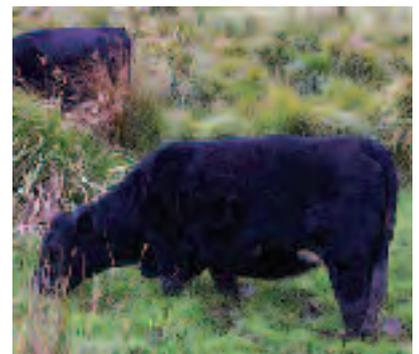
From mid 2009 it became compulsory to fence stock out of the Coastal Marine Area (all tidal areas). For more information see the Northland Regional Council brochure "Keep stock out of the tide".

The Northland Regional Council's Environment Fund can help fund fencing of wetlands on private land.



Creating ponds requires specialist advice

NRC Photo



Keep stock out of wetlands

GWRC Photo



The difference a fence can make

NRC Photo



Reed sweet grass (*Glyceria maxima*) - invasive weed of wetlands

NRC Photo

4 Control the weeds

Weeds are one of the greatest threats to wetlands and, in many cases, weed control will be the most important thing you can do. If you're planning any planting, you must control weed species in and around the area first – and continue weed control once your planting is complete.

The first step is a weed audit, in which you use a map of the wetland to locate and identify weed infestations. The next step is to gather information on how to control the weed species. You can then decide where to start the weed control, and when – and remember, it may take several seasons to control a serious weed infestation.

You may find you need help from a specialist qualified to use herbicides in wetlands.

Contact the Northland Regional Council's Biosecurity Officers for information and advice on how to control wetland weeds. Always follow the herbicide manufacturer's instructions.



Yellow Flag iris is a serious wetland weed

NRC Photo

Pest willows

Pest willows were originally introduced to New Zealand for bank stability, shelterbelts and fodder. However, their dense growth can block stream flow and shade out native species. Crack willows and hybrids with weeping willows are particularly invasive – broken branches take root easily in muddy soils. Not all willows are pests – some non-seed producing willows are currently being recommended for erosion control.

Pest willows can be controlled in a number of ways – we recommend you first seek specialist advice from Northland Regional Council's Biosecurity Officers.

Helpful hints on weed control

- When working with spades and machinery in weedy areas, wash them down before using them elsewhere on the farm to prevent weed spread.
- Fence out stock to reduce the spread of weeds. The fence should be set back far enough from the water's edge to allow for seasonal fluctuations in water level. This fenced off riparian margin will need to be managed to control weeds.
- Barley straw reputedly inhibits algal growth and boosts aquatic insect life in slow-moving water. Two bales should keep around half a hectare of shallow, open water free of algae for six months. Either spread it out or anchor it in one position – eventually it will sink and decompose.



Wetland which has become dry and weedy

NRC Photo

If your wetland is drying out from a change in water supply or drainage, weeds such as gorse, pampas and Mexican devil weed will move in. If this happens you may need to restore water levels. Old drain tailings are good places for weeds such as pampas grass to colonise. These areas may need special attention and restoration with

5 Control animal pests

Some wildlife such as paradise shelduck will respond positively to a basic improvement in wetland habitat. However, other species such as pateke and bittern will require additional help, particularly in the control of animal pests. Some animal pests in wetland areas include:

- Possums, hedgehogs, stoats, weasels, ferrets, cats and rats. They take birds' eggs and most will also eat chicks and adult birds.
- Rabbits, hares, goats and possums eat wetland plants.
- Dogs can harass and kill wetland birds. High-tensile net fencing will discourage dogs from entering the wetland and provide a more secure area for birds to nest.

Effective pest control can sometimes lead to an increase in pukeko numbers. Although a native to New Zealand and a natural part of a wetland ecosystem, pukeko nibble on and uproot newly planted seedlings. To deter them, use large and heavy potted plants. Alternatively, try placing a hedge of short sticks around the plants, or use plant protectors.

Regular animal pest control will enhance bird life in your wetland and protect young plants.

Contact the Northland Regional Council for practical advice and fact sheets on the best animal pest control methods for your situation.
www.nrc.govt.nz/nasties



Pest Stoat

Department of Conservation Photo



Fish pass

NRC Photo

6 Provide 'extras' for wildlife

Extras for birds

As well as providing the basics for birds (water and shelter), you can provide a number of 'extras' that will make your wetland a highly desirable home:

- Provide logs and trees in the water as well as gentle, sloping banks for perching sites and shelter.
- Create bays and screens of plants for birds to hide behind.
- During the breeding season (July to December for most species), either stop or significantly reduce grazing and other activities – birds are particularly sensitive to disturbance at this time.
- Carry out regular predator (eg. stoat and feral cat) control throughout the year. The best method is to carry out intensive control prior to and during the bird breeding season, with maintenance control throughout the rest of the year.
- If your wetland is near a block of native bush or another wetland, consider linking them with a "green corridor" of native plants.

Contact the Northland Regional Council's Land Management Team, or your local Department of Conservation office for more advice.

Extras for fish

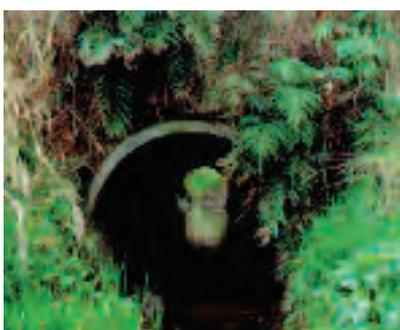
If your wetland is connected to a stream (or streams) at least 10 cm deep, it should be accessible to most native freshwater fish.

A number of native fish species spawn in estuarine areas and the young migrate upstream. Long stretches of fast-flowing or polluted water and overhanging culverts can act as impassable barriers and stop fish reaching your wetland.

Native fish also need streams with clear water, shading and cover. Muddy water limits their vision and reduces their food supply of aquatic insects.

Help fish find your wetland using the tips below:

- Plant overhanging species like harakeke (flax) and sedges for shelter and to keep the water cool.
- A hay bale placed at the head of a ditch entering your wetland will act as a simple silt trap.
- When clearing drains, leave one side or parts of it untouched until plants have grown back. Plant tall trees on the north side for shade.
- If using culverts in streams, set them low in the stream bed.
- Rough up the smooth bottom of culverts with cement or rocks to slow water flow.



A well designed culvert allows fish access upstream

Doveel Photo



Hanging culverts create a barrier to fish movement

Doveel Photo

7 Start planting

Prepare a planting plan

Plant appropriate species in your wetland. Plants such as raupo do not grow in peat bogs, so seek advice to ascertain what type of wetland you have. Common plants such as manuka, flax or cabbage tree are available cheaply in nurseries and may be the best option for the early stages of your replanting programme.

Make sure your wetland is thoroughly stock-proof before you plant.

When you're ready to plant your wetland, divide it into three plant zones:

- Margins and banks with drier soils.
- Wet soils, with regular temporary flooding.
- Shallow water/water margin.

Start by spending some time to observe what is already present on the site. Identify any desirable plants you already have in each zone, and list the plants you can use in each, taking into account wind and drainage. The guide on page 18 includes a small sample of potential species. Not all will be suitable for your area or situation – coastal and upland areas, in particular, have their own species associations.

Coastal saltmarshes usually grade into swamps, so you may need to use both coastal and high fertility freshwater species.

Discuss your list with local experts such as native plant nurseries, Northland Regional Council Land Management Team and the contacts at the back of this guide.

Eco-sourcing

Eco-sourcing means planting appropriate native plants which come from close to your wetland. Generally, sourcing plants from within your ecological district is acceptable. Local plants are usually adapted to local conditions and grow the best. Also, many species are genetically variable from area to area even though they may look similar. Many nurseries sell local plants, so always ask first.

You may also be able to grow some of the plants you need from seeds or cuttings taken from neighbouring wetlands. Make sure you get the landowner's permission first. Keep use of cuttings to a minimum and take them from a large number of parent plants, to ensure a good genetic mix. Where appropriate, ensure that you have both male and female plants. Specialist nurseries often have a good range of wetland species from your local area.

Timing

In wet areas, around the water's edge and in shallow water, plant in summer when water levels are low, the water is warm and birds have finished breeding.

Otherwise, plant hardy, frost-tolerant species in autumn and winter. Plants that need shelter or shade can be planted one to two years later, once cover has developed.



Takahiwai School planting in their local wetland

NRC Photo



Plantings

NRC Photo



Planting on wetland edge

NRC Photo



Mulched cabbage tree

Site preparation

Clear a one-metre circle around each planting spot with a spade or herbicide to prevent competition from grass and weeds. This will make sure your plants get enough light and nutrients.

Planting

Remember, native plants don't tolerate grazing by stock - protect your investment by keeping stock out.

When planting:

- Choose sites suitable to each plant's growing requirements, leaving space for them to grow. Ferns, rushes and small sedges can be planted three per square metre. Larger plants need more room. Planting at least one plant per square metre saves work clearing or replanting later.
- Dig a hole twice the size of the plant container, leaving some soft soil at the bottom. Set the plant in the hole and gradually fill in the soil, compacting it to remove air gaps.
- If you're planting on dry sites around the edge of your wetland, form a hollow around the plant's base to trap rainfall. Plant dry sites in spring or autumn.
- Give the plants and surrounding soil a good watering. Water young plants over dry spells.
- In very wet soil plant nursery-grown plants on a small mound about 30 cm high, to give their roots time to get used to the saturated soil. Plant wettest sites during summer.

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



Native sun orchid in gumland

8 Looking after your plants

Weeds can overwhelm your plants in the first one to three years and smothering by tall grass is the most common cause of failure.

It's important to maintain your plants by clearing the weeds around them. You can weed by hand or with a grubber or with careful use of a suitable herbicide - and save further weeding by using mulch or mats (eg non-rubberised carpet underlay) that eventually decompose. Pests such as rabbits and possums should also be controlled, particularly early on. Pukeko and rabbits can be deterred by painting a mix of egg powder and acrylic paint onto young plants.

Once the plants have grown tall enough, they will begin to shade out grasses and aquatic weeds and will no longer need weed control. After about three years your plantings should take care of themselves. Overhanging trees and plants will provide shade, reduce water temperature and provide habitat for fish and invertebrate species. Long, dense grass is excellent for trapping any run-off from the surrounding catchment.



Te Werahi wetland, near Cape Reinga

Herbicides

There are some herbicides registered for use on and under water. Seek advice for use. Glyphosate herbicides reduce the need for manual weeding if used carefully. We don't recommend long-lasting residual herbicides, as they remain toxic to plants three to four months after application.

The best time to spray is late summer when water levels are low and nesting and flowering has taken place.

You can get more information on suitable herbicides and suggested application rates from Biosecurity Officers at the Northland Regional Council. **Always follow the herbicide manufacturer's instructions.**

You may need to get consent from the Northland Regional Council, depending on what herbicide you use. Check first.

More planting tips

- The best time to plant in wet areas is in summer when the water levels are at their lowest.
- To ensure your plants have the best possible chance of survival, use larger potted plants. These are also less likely to be uprooted by pukeko.
- When planting the dry edges of wetlands, use a mulch at least 10 cm deep. This can be untreated wood chips, compost, cardboard, old non-rubberised carpet underlay or rotted hay. It will help to reduce evaporation, keep weeds down and add nutrients. Alternatively, leave a low grass cover around the plants for the first summer (until March) to help conserve water.
- Use fast-growing species such as manuka as nurse plants to provide shade for seedlings underneath.
- Plant natives such as coprosmas which bring the birds. Birds assist natural regeneration by spreading seed.

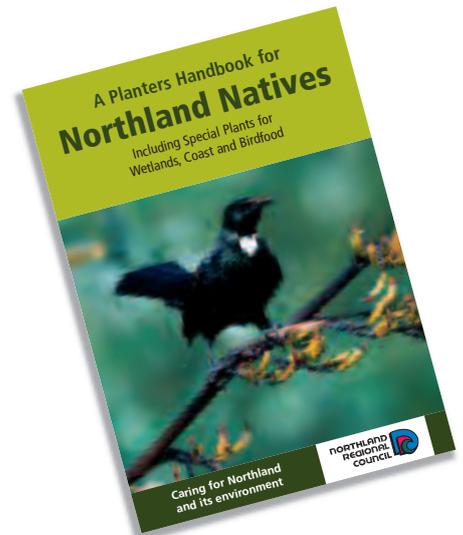
9 Monitor your progress

Make sure you maintain an ongoing programme of weed and pest control. Keep a photographic record and a diary of progress. It will help you to learn what works and what doesn't and make changes as necessary. It will also be a record to show you how much you have achieved and what additional plants and animals arrived naturally as your wetland recovered.

10 Protect your investment

You can protect your investment of time and energy by placing a covenant on the site. This means you or subsequent owners retain ownership and control, but the wetland is protected forever. There are several different kinds of covenant.

Contact the QEII National Trust for information and advice on covenants.



"A Planters Handbook for Northland Natives" is available from Northland Regional Council staff.



Epakauri gumland near Kaitaia

NRC Photo

Northland Regional Council Wetland Database

If you would like your wetland to be listed on Northland Regional Council's Wetland Database, please contact a Land Management Officer.

A guide to plants for wetlands in Northland

BOTANICAL NAME	COMMON NAME Plus application and comments	HIGH FERTILITY Swamps, floodplains, marshes, seepages, ponds, riparian.				LOW FERTILITY Bogs, fens, gumlands.		COASTAL Margins, coastal wetlands, salt marshes.		FEATURES Seed, fruit, nectar or insects for birds, plant height and plant type.		
		Shallow Water		Edges		Damp	Drier	Damp	Drier	Bird Food	Height	Type
		> 30 cm	< 30 cm	Damp	Banks							
<i>Alectryon excelsus</i>	titoki (banks, floodplains)				√					√	tall	tree
<i>Apodasmia similis</i>	oioi (saltmarsh)							√		√	low	rush
<i>Astelia grandis</i>	mauri (rare in wild)			√		√					med	herb
<i>Austroderia fulvida</i>	toetoe (river banks, swamp edges)			√				√			med	grass
<i>Blechnum novae-zelandiae</i>	kiokio (common)			√	√						low	fern
<i>Bolboschoenus fluviatilis</i>	kukuraho, marsh clubrush							√			low	sedge
<i>Carex flagellifera</i>	Glen Murray tussock			√	√				√		low	tussock
<i>Carex geminata</i>	tussock (common, swamps)		√	√						√	low	tussock
<i>Carex lesssoniana</i>	tussock			√							low	tussock
<i>Carex secta</i>	purei (less common)		√	√						√	med	tussock
<i>Carex virgata</i>	purei (common)		√	√						√	med	tussock
<i>Carpodetus serratus</i>	putaputaweta				√					√	tall	tree
<i>Coprosma macrocarpa</i>	karamu (mostly near coast)				√				√	√	tall	small tree
<i>Coprosma propinqua</i>	mingimingi		√	√						√	tall	small tree
<i>Coprosma rhamnoides</i>	coprosma (banks, floodplains)				√					√	low	shrub
<i>Coprosma robusta</i>	Karamu (common)				√				√	√	tall	small tree
<i>Coprosma rotundifolia</i>	coprosma (floodplains)			√	√					√	med	shrub
<i>Coprosma tenuicaulis</i>	hukihuki, swamp coprosma		√	√						√	med	shrub
<i>Cordyline australis</i>	ti kouka, cabbage tree		√	√	√			√	√	√	tall	tree
<i>Corynocarpus laevigatus</i>	karaka (banks, floodplains)				√				√	√	tall	tree
<i>Cyathea dealbata</i>	ponga, silver fern				√						tall	fern
<i>Cyathea medullaris</i>	mamaku, black tree fern				√				√		tall	fern
<i>Cyperus ustulatus</i>	giant umbrella sedge		√	√				√			med	tussock
<i>Dacrycarpus dacrydioides</i>	kahikatea (banks, floodplains)		√	√	√					√	tall	tree
<i>Dianella haemata</i>	inkberry, turutu, swamp blueberry (gumlands)					√	√			√	low	large herb
<i>Dianella nigra</i>	turutu, blueberry (banks)				√		√			√	low	large herb
<i>Dicksonia squarrosa</i>	wheki		√		√						tall	fern
<i>Elatostema rugosum</i>	parataniwha (sheltered gullies in shade)			√							low	large herb
<i>Eleocharis acuta</i>	spike rush	√	√	√							low	sedge
<i>Eleocharis sphacelata</i>	kuta, tall spike sedge	√									med	reed
<i>Ficinia nodosa</i>	wiwi, knobby club-rush							√	√		low	sedge
<i>Freycinetia banksii</i>	kiekie (shelter/shade)			√	√						med	scrambler
<i>Gahnia setifolia</i>	cutty grass, mapere				√		√				low	sedge
<i>Gleichenia dicarpa</i>	waewaekaka, umbrella fern					√	√				low	fern
<i>Hebe stricta</i>	koromiko (river/swamp edge)				√			√	√		med	shrub
<i>Isachne globosa</i>	swamp millet (swamp beds)		√	√							low	grass
<i>Isolepis prolifera</i>	sedge (common)		√	√							low	sedge

<i>Juncus edgariae</i>	wiwi, rush (common)			√						low	rush
<i>Juncus kraussii</i> var. <i>australiensis</i>	wiwi, sea rush (saltmarsh)							√		low	rush
<i>Juncus pallidus</i>	wiwi, rush (big common rush)		√	√						low	rush
<i>Juncus planifolius</i>	rush (common)			√						low	rush
<i>Kunzea ericoides</i>	kanuka (common coloniser, dry ground)								√	tall	tree
<i>Laurelia novae-zelandiae</i>	pukatea (group plant)		√	√						tall	tree
<i>Lepidosperma australe</i>	four-square (gumland)							√		low	sedge
<i>Leptospermum scoparium</i>	Manuka (common coloniser)		√	√	√			√		tall	tree
<i>Lobelia anceps</i>	native lobelia (small creeper)			√				√		low	herb
<i>Machaerina arthropphylla</i>	wiwi, rush like sedge						√			low	sedge
<i>Machaerina articulata</i>	jointed twig-rush	√								med	reed
<i>Machaerina juncea</i>	wiwi, rush like sedge		√	√					√	low	sedge
<i>Machaerina rubiginosa</i>	wiwi, rush like sedge						√			low	sedge
<i>Machaerina teretifolia</i>	wiwi, rush like sedge						√	√		low	sedge
<i>Meliclytus ramiflorus</i>	mahoe, whitey wood					√			√	tall	tree
<i>Muehlenbeckia australis</i>	large-leaved muehlenbeckia (riverbanks)					√				tall	climber
<i>Muehlenbeckia complexa</i>	pohuehue, wire vine (coast)								√	low	scrambler
<i>Myriophyllum propinquum</i>	common milfoil (shallow water)	√	√							low	herb
<i>Myriophyllum robustum</i>	stout milfoil (rare in wild)	√	√							low	herb
<i>Myrsine australis</i>	mapou, red matipo					√			√	tall	tree
<i>Persicaria decipiens</i>	tutanawai, swamp willow weed (swamp beds, streams)		√	√						low	herb
<i>Phormium tenax</i>	harakeke (group plant)			√	√			√	√	med	herb
<i>Pittosporum tenuifolium</i>	kohuhu (banks, floodplains)				√					tall	tree
<i>Plagianthus divaricatus</i>	saltmarsh ribbonwood							√	√	med	tree
<i>Plagianthus regius</i>	manatu, ribbonwood (river banks only)				√					tall	tree
<i>Podocarpus totara</i>	totara (common)				√				√	tall	tree
<i>Potamogeton cheesemanii</i>	red pondweed (shallow water)	√	√							low	aquatic
<i>Schoenoplectus tabernaemontani</i>	kapungawha, lake club-rush	√	√	√				√		low	sedge/reed
<i>Schoenus brevifolius</i>	wiwi, rush-like sedge						√	√		low	sedge
<i>Schoenus tendo</i>	wiwi, rush-like sedge (under manuka)							√		low	sedge
<i>Sophora chathamica</i>	coastal kowhai (east coast sites)								√	tall	tree
<i>Sophora microphylla</i>	kowhai (river and floodplain inland)				√				√	tall	tree
<i>Sparganium subglobosum</i>	maru, burr reed (rare in wild)		√	√						low	sedge
<i>Streblus heterophyllus</i>	turepo, milk tree (floodplains)				√				√	tall	sedge
<i>Syzygium maire</i>	maire tawake, swamp maire		√	√						tall	tree
<i>Triglochin striata</i>	arrow grass (very small)							√		low	turf
<i>Typha orientalis</i>	raupo, bullrush (common swamps)	√	√							med	reed
<i>Weinmannia silvicola</i>	towai (shelter, banks)					√				tall	tree

KEY √√√ = plant plenty; √√ = plant moderately; √ = plant occasionally depending on site. **Height:** tall = >5m; med = 2-5m; low = <2m. **Plant Type:** aquatic = plant which grows in and under water; fern = seedless plant in fern group; herb = soft plant, not woody; reed = tall, soft plant emergent from open water; rush = plant in Genus *Juncus* but also used for any plant with stiff, upright, non-flattened stems; sedge = plant in Family Cyperaceae usually grass like, tussock like or rush like; scrambler = plant that climbs without twining or grasping; shrub = woody plant less than 2m tall; tree = woody plant over 2m tall; turf = groundcover plants less than 3cm tall; tussock = densely tufted grass or sedge, grass like. **Note:** Some of these plants may not be available from nurseries or may be hard to find – go to a specialist nursery or grow from seed or cuttings. For additional species for wetland banks and margins see “A Planters Handbook for Northland Natives” (Northland Regional Council) or seek advice from a land management officer.

Northland Regional Council Environment Fund

Each year this fund distributes money to assist with projects that improve or protect the Northland environment.

The Environment Fund may provide up to 50% of the total cost of the project where it concerns a high value, formally protected wetland.

For application forms, contact the Northland Regional Council or visit our website: www.nrc.govt.nz/environmentfund

Other organisations that may offer financial assistance are listed opposite.



Dumping rubbish close to wetlands is not allowed

NRC Photo

Created a wetland? Register it!

If you have created a wetland in a site where one did not previously exist, it's a good idea to register it with Northland Regional Council so you can manage it later. To find out more, contact the council's Land Management Team on 0800 002 004.

11 Wetland rules

Wetlands are covered by Northland Regional Council's Regional Water and Soil Plan for Northland. The plan has nine criteria that define Significant Indigenous Wetlands. A wetland only has to meet one of the criteria to qualify. This means that most wetlands dominated by native plants are classed as significant. The reason for the tight criteria is that more than 95% of Northland's wetlands have been cleared and drained and so most that remain are considered important.

Rules in the Water and Soil Plan mean that most human activities which are undertaken in Significant Indigenous Wetlands are non-complying and require resource consents. Even activities such as drainage or maintenance of drains on neighbouring properties require consents if they could cause any change to the seasonal or annual range in water level of an indigenous wetland to such an extent that it may adversely affect the wetland's natural ecosystem. Activities covered in the plan that could affect wetlands include:

- Land disturbance including excavation, drilling, reclamation, vegetation clearance and drainage.
- Earthworks or vegetation clearance within the riparian management zone (a strip of land of up to 20 metres width around a wetland).
- Building of structures including culverts, bridges, causeways crossings, dams, weirs, pipelines, fences and maimais.
- Discharges including wastewater, domestic sewage or animal effluent and other contaminants within 20 metres of a wetland, river or stream.
- Burning.
- Dumping of rubbish.
- Disposing of dead stock within 50 metres of a wetland or waterway.
- Coastal grazing – stock must be fenced out of the area below spring tide, including saltmarshes.
- Planting – the introduction of any plant species listed in any Regional Pest Management Strategy for Northland is prohibited.
- Herbicide – certain herbicides are registered for use on or under the water. Seek advice from a Northland Regional Council Biosecurity Officer before using herbicides in wetlands.
- Water take – a certain amount of surface water can be taken for domestic and stock needs provided it has no more than a minor effect on a wetland or natural ecosystem.

Check first with the Northland Regional Council and your district council if you are going to undertake any of the above activities in or close to a wetland. If you see any of the above activities occurring in or near a wetland without a consent – please phone the Northland Regional Council's 24/7 Environmental Hotline 0800 504 639.

CONTACTS

FOR MORE INFORMATION

Northland Regional Council

WHĀNGĀREI: 36 Water Street, Private Bag 9021, Whāngārei 0148;
Phone 09 470 1200, Freephone 0800 002 004, Fax 09 470 1202.

ŌPUA: Unit 10, Industrial Marine Park, Ōpua 0200;
Phone 09 402 7516, Fax 09 402 7510.

DARGAVILLE: 61B Victoria Street, Dargaville 0310;
Phone 09 439 3300, Fax 09 439 3301.

KAITĀIA: 192 Commerce Street, Kaitāia 0410;
Phone 09 408 6600, Fax 09 408 6601.

Environmental Hotline: 0800 504 639

Website: www.nrc.govt.nz

QEII National Trust

The QEII National Trust helps private landowners protect areas of bush and wetland on their property by using covenants. For more information, visit www.openspace.org.nz or phone (04) 472 6626.

Fish and Game New Zealand, Northland Region

Fish and Game New Zealand provides specialist advice and support for landowners seeking to enhance wetlands or develop farm ponds for game bird habitat. Funding may be available and approved projects can receive up to 50 percent financial support. For more information, visit www.fishandgame.org.nz or phone (09) 438 4135.

Department of Conservation

Department of Conservation staff can provide advice on how to identify, maintain, protect, and where necessary, enhance conservation values. Check out DOC's website www.doc.govt.nz or phone the Northland Conservancy Office (09) 470 3300.

New Zealand Landcare Trust

The New Zealand Landcare Trust helps with community group projects and may be able to provide funding. For more information, visit www.landcare.org.nz or phone northern regional office on 09 430 0954.

Your district council

Some councils offer help for landowners restoring and protecting wetlands. Check with your local council for more information. You may also need to contact your district council about resource consents.





Putting Northland first

Contact us:

Main Office

36 Water Street, Whāngārei.
Private Bag 9021, Whāngārei
Mail Centre, Whāngārei 0148

Ōpua Office

Unit 10, Ōpua Marine Park,
Ōpua 0200.
T: 09 402 7516 | F: 09 402 7510

Kaitiāia Office

192 Commerce Street,
Kaitiāia 0410.
T: 09 408 6600 | F: 09 408 6601

Dargaville Office

61B Victoria Street,
Dargaville 0310.
T: 09 439 3300 | F: 09 439 3301

Telephone: 09 470 1200 **Facsimile:** 09 470 1202

Email: mailroom@nrc.govt.nz

Freephone: 0800 002 004

24/7 Environmental Hotline: 0800 504 639

Website: www.nrc.govt.nz

Facebook: www.facebook.com/NorthlandRegionalCouncil

Twitter: www.twitter.com/NRCExpress