

Looking after your wetland



Ladies'
Tresses
Orchid

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 provide some useful pointers.

Credits

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Contents

Wetland wise

The forgotten taonga	04
What is a wetland?	05
Why wetlands are important	05
Wetland types in the Northland Region	06
Wetland wildlife	08

How do I restore a wetland? 12

Wetland rules	13
Look, learn and plan	14
Investigate the water supply	15
Keep stock out	16
Control the weeds	17
Provide extras for wildlife	18
Control animal pests	19
Start planting	20
Looking after your plants	22
Monitor your progress	23
Protect your investment	23

A guide to plants for wetlands in Northland 25

Further information	30
Contacts for more information	31

The forgotten taonga

Wetlands are among the most productive ecosystems in the world. While many have been lost, there is a growing appreciation of the beauty and the biological importance of wetlands.

Māori regard repo (wetlands) as taonga (treasured possession), and they have historical, cultural, economic and spiritual significance.

If trees are the lungs of the planet, then wetlands are its kidneys. They're good for the Earth, and they're good for the people – providing benefits that help with our overall health and wellbeing.



Fighting climate change

Wetlands play an important role in fighting climate change. Layers of peat contain enormous amounts of carbon, and typically their carbon content is over fifty percent. Peat bogs and fens store up to 10 times more carbon than other ecosystems. When wetlands are drained or degraded, peat decomposes quickly, and they can become powerful greenhouse chimneys releasing carbon into the atmosphere. Restoring wetlands means organic matter can rebuild, and carbon release is contained.

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, salt marshes, mangroves and some river, lake and stream edges.

Why wetlands are important

In the past, many people didn't recognise the true value of wetlands. Consequently, nearly all of them have been converted for the production of an agricultural commodity or urban use. Wetlands help prevent flooding and improve water quality, help fight climate change, as well as providing the necessary habitat for many unique species of plants and animals. Conserving and restoring wetlands will offer many benefits to the wider environment.



Improving water quality

Bacteria in damp wetland soils contribute to cleaner water by absorbing and breaking down nutrients from fertilisers, chemicals, road runoff and animal wastes. About 90% of the nitrogen contained in farm runoff can be broken down in wetlands. Wetland plants also trap waterborne sediment, preventing silt from entering streams and harbours. Silt clouds the water and clogs fish gills, while phosphorous bound to the silt particles in the water increases algal and weed growth.

Cleaner water is better for stock, wildlife and people.



A food source

Wetlands are among the most productive places on Earth, providing an enormous food source for people, fish, birds and other animals. Wetland animals, especially tuna (eels), are important to Māori, as they're valuable mahinga kai (food).



A giant sponge

Wetlands act as a giant sponge, helping to soak up water and this can help reduce flood intensity. 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 be taken up by the plant life. Through this absorption, flood heights can be reduced, and this helps to minimise damage to properties, livestock and land. In summer, the stored water is released slowly, maintaining some of the surface water flow during dry periods.

Peak flood levels can be reduced considerably in catchments with one third of their area in lakes or wetlands.




A cultural treasure

Wetlands are important to Māori, these taonga are closely linked to the identities of the tāngata whenua (people of the land). Ko te wai te ora ngā mea katoa. Water is the life giver of all things. Waterways are home to many taniwha (spiritual beings) that look after the people and ensure their physical and spiritual protection. As well as kai, wetlands provide building and weaving materials, such as kuta, raupō and harakeke (flax). They provide medicines, and dyes used for seasoning timber and restoring/preserving precious artefacts.

Wetland types in Northland

The Northland region has

9  **Main types of wetland**

- » **Bogs**
- » **Fens**
- » **Swamps**
- » **Salt marshes**
- » **Marshes**
- » **Gumlands**
- » **Shallow water**
- » **Seepages**
- » **Ephemeral (seasonal) wetlands**



Bogs

Bogs are rare and precious in the Northland region. Bogs are peatlands that are fed only by rainfall, they are low in fertility and are acidic. Healthy peat bogs are year-round sinks of carbon, locking up to five tons per hectare – indefinitely. These wetlands can become powerful greenhouse chimneys if disrupted.

Bogs support a variety of plants including sedges, rushes, umbrella ferns and mānuka. Bogs are home to a variety of specialised plants, with the wettest bogs dominated by sphagnum moss. In Northland, bogs are home to the nationally threatened Northland mudfish.



Fens

These are another rare type of wetland. Fens are mostly infertile, like bogs, but have a thinner layer of peat. They also receive runoff from surrounding land, so have some areas of fertility. They usually have higher biodiversity than other wetland types.



Swamps

Most wetlands on private land are swamps. They're 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 raupō (bullrush), pūrei (Carex sedges) and harakeke (flax). The organic matter these plants produce supports populations of aquatic invertebrates and birds.



Salt marshes

(coastal wetlands/estuaries)

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.





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 waterlogged soil. Some dune lakes near the coast, especially those around Poutō are associated with huge marsh wetlands.



Gumlands

Northland is home to almost all of the viable gumlands left in New Zealand. Gumlands may not appear to be wetlands as they're 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. The poor drainage and the hard pan soils mean they contain unique wet heathland communities – vegetation made up of hardy woody shrubs with tough, spikey leaves adapted to survive dry periods and infertile conditions. Gumlands share many species with bogs as they are both infertile. These are very rare now as most have been cleared or developed.



Shallow water

(rivers, lakes, stream edges)

Open water, though not strictly a wetland type, often has associated shallow water margins surrounded by wetland vegetation. These areas are essential water bird and native fish habitat.

Northland is home to more than 400 dune lakes.

Dune lakes and their associated wetlands are home to a vast diversity of native plants and animals, including the rare freshwater fish, the dune lake galaxias and the dwarf inanga, which are only found in some dune lakes in Northland.



Seepages

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

Fertile vs infertile

Wetlands have various environmental gradients (physical, chemical, hydrological and biological), and they can either be fertile or infertile. Fertile wetlands have plenty of nutrients, so plants grow easily in them. Infertile wetlands are low in the nutrients that plants need to grow, such as phosphorous or nitrogen, so plant growth is often slow. Infertile wetlands structure plant communities that tolerate low fertility.



Ephemeral wetlands

Seasonal or ephemeral wetlands are areas where water ponds in winter and dries up in summer. This gives rise to short, turf vegetation.

The most common ephemeral wetlands are in coastal dunes where they are known as dune slacks.

Wetland wildlife

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



Orb web spider



Australasian little grebe

Brimming with birds
The size and diversity of wetlands in an area determine the variety of birdlife that can be supported.

Most of New Zealand's wetland animals are not found anywhere else in the world. For birds such as the Australasian bittern, fernbird, marsh crake, and pāteke (brown teal) wetlands are critical habitats. Open water wetlands (ponds, lakes, dams and shallow water) are critical for waterfowl such as the New Zealand dabchick and New Zealand scaup.

Animals that can only live in wetlands face an uncertain future through habitat loss and/or damage. The Australasian bittern is classed as threatened and in this category it is

nationally critical, meaning it is at the highest risk of extinction, and the short-jawed kōkopu is nationally vulnerable. Conservation and restoration programmes help to provide the habitat they need and ensure these animals survive in the future. Conservation efforts have seen pāteke populations starting to recover, but they are still at risk.



Australian emperor dragonfly

Focus on fish

Many of New Zealand's native freshwater fish, such as our tuna (shortfin and longfin eels), īnanga, giant and banded kōkopu, live in wetlands for some, or all of their lives. These fish also journey to and from the sea using a corridor of estuaries, rivers, streams and drains. This watery pathway must stay intact if they are to breed and 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. Mudfish are unique to New Zealand, and habitat loss is the key reason for the decline of this species.



Giant kōkopu

A home for insects and other creatures

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



Kēwai

Īnanga

The juveniles of many of our native fish, such as banded and short-jawed kōkopu, īnanga and kōaro, are collectively known as 'whitebait'. Their eggs hatch in autumn and the larvae then wash out to sea. Six months later they make the hazardous return journey as juveniles. Most of the whitebait fishery catch is īnanga as they are the most common.

Juvenile kōkopu and kōaro can travel large distances upstream, even climbing damp rocks beside steep waterfalls, until they reach sheltered streams and wetland habitats. Juvenile tuna are also good climbers and can adapt different climbing strategies depending on the environment.



Īnanga

The birds of wetlands



Bird	Habitat requirements	Breeding season	Population Risk*
Australasian bittern (matuku-hūrepo)	Australasian bittern inhabits dense, reedy vegetation in shallow freshwater wetlands. They are often difficult to see. Birds go into a 'freeze' pose when feeling threatened, where they stand straight and still, with their heads pointing to the sky. Sometimes a hiding bittern will sway in the breeze - when combined with its cryptic plumage (mottling and streaks), a bittern is easy to miss. Northland is one of the strongholds for bittern.	Aug-Feb	Category Threatened Classed as Nationally critical - The highest threatened status
North Island fernbird (mātātā)	Fernbird prefer wetlands with dense ground cover under a selection of shrubs and small trees like mānuka. Although fernbird are found in good numbers elsewhere, they are concentrated in Northland.	Aug - Mar	Category At Risk Classed as Declining
👁️ Spotless crane (pūweto) Marsh crane (koitareke, kotoreke)	These secretive birds feed in permanently shallow water or muddy margins under raupō, flax and other wetland plants. They build nests under the shelter of sedges, such as pūrei (tussock sedges) and occasionally with over-hanging raupō and among stands of shrubs, such as mānuka.	Spotless crane Sep-Jan Marsh crane Sep-Feb	Category At Risk Classed as Declining
Banded rail (moho pererū)	The banded rail, or moho pererū as it is known to Māori, is similar to weka, but not as large. They are usually quite shy but may become very tame and bold in some circumstances. In the northern North Island they mainly inhabit mangroves and salt marshes, with less time spent in adjacent freshwater wetlands and shrublands in the upper reaches of estuaries.	Sep-Mar	Category At Risk Classed as Declining

Key █ Nationally critical █ At risk - declining █ At risk - recovering █ Not threatened
 * Status is reviewed every three years. 👁️ Pictured



Bird	Habitat requirements	Breeding season	Population Risk*
<p>Grey duck (pāpera),</p> <p>NZ shoveler (kuruwhengi),</p> <p>👁️ Grey teal (tētē, tētē moroiti)</p>	<p>These birds prefer shallow water around the edges of a pond or lake. They need open water to moult in safety, away from predators.</p>	<p>Grey duck Aug-Jan</p> <p>NZ shoveler Oct-Feb</p> <p>Grey teal Jun-Feb</p>	<p>Category Threatened</p> <p>Classed as Nationally critical - The highest threatened status</p> <p>Category Not threatened</p> <p>Category Not threatened</p>
<p>👁️ New Zealand dabchick (weweia)</p> <p>Australasian little grebe</p>	<p>New Zealand dabchick and Australasian little grebe feed in deep, open water but build their nests on floating rafts of vegetation among reeds.</p>	<p>New Zealand dabchick Jun-Mar</p> <p>Australasian little grebe Sep-Apr</p>	<p>Category At Risk</p> <p>Classed as recovering</p> <p>Category Coloniser</p>
<p>Brown teal (pāteke)</p>	<p>Pāteke feed in damp, short pasture, seepage areas, and the shallows of ponds and estuaries. They nest among dense clumps of sedges and rushes, usually near water. Pāteke prefer to roost beside the deep water of ponds, streams or estuaries, usually beneath large trees.</p>	<p>Jul - Oct</p>	<p>Category At Risk</p> <p>Classed as recovering</p>
<p>New Zealand scaup (pāpango)</p>	<p>New Zealand's smallest and only diving duck, scaup prefer deep, open and clear water with abundant invertebrates (insects, worms and snails). They nest in dense wetland vegetation such as raupō and purei.</p>	<p>Oct-Mar</p>	<p>Category Not threatened</p>
<p>👁️ Tūi, waxeye and kūkupa</p>	<p>These birds visit wetlands at certain times to feed. Tūi and silvereeye feed on nectar-producing plants like harakeke (flax). Kūkupa (NZ pigeon) visit wetlands to feed on fruiting trees like kahikatea.</p>	<p>Tūi Sep-Feb</p> <p>Waxeye Sep-Mar</p> <p>Kūkupa Oct-Apr</p>	<p>Category Not threatened</p>

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!

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. This advice is free unless it's required as a condition of a resource consent. 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 plan rules, you cannot undertake some works in or near a wetland as they could cause adverse effects. This includes building structures, drainage, clearing or excavating. Please seek advice before you start work, as many wetlands in Northland have high biodiversity values and perform essential water quality and quantity functions. Check that you do not require resource consent before you start work in your wetland.



1

Wetland rules

Wetlands are covered by our regional plan which protect wetland values, taking a stricter approach for high value 'significant' wetlands. Wetlands may be recognised as significant due to important ecological roles or by merely exceeding a certain size based on how rare the wetland types are. Most natural wetlands larger than 0.5ha will be defined as significant regardless of the wetland type.

Regional Council Biodiversity Advisors can help provide more information about your wetland type and associated rules.

Constructed wetlands are excluded from this definition if they have been developed deliberately. Check with regional council staff about whether plan rules apply to your man-made wetland.



Plan rules (*see page 12*) mean that most human activities with adverse effects on wetlands will need resource consent. Even activities such as drainage or maintenance of drains on properties require consent. This is because drainage could cause a change to the seasonal or annual range in the water level of an indigenous wetland to such an extent that it may adversely affect the wetland's natural ecosystem.

Northland Regional Council environment fund

Each year this fund contributes to projects that improve or protect Northland's natural environment.

We may contribute (subject to criteria) towards the cost of fencing stock from waterways, including wetlands. [nrc.govt.nz/environmentfund](http://www.nrc.govt.nz/environmentfund)

For more information, contact one of Northland Regional Council's Biodiversity Advisors or visit our website www.nrc.govt.nz/environmentfund

Activities covered in the regional plan that could affect wetlands include:

- » Land disturbance including excavation, drilling, reclamation, drainage, or vegetation clearance (including by grazing).
- » Earthworks or vegetation clearance within wetlands or 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 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 salt marshes.
- » Planting – the introduction of any plant species listed in any Regional Pest Management Strategy for Northland is prohibited. Only indigenous plants can be planted in significant wetlands.
- » Herbicide – only certain herbicides are registered for use on or under the water. Seek advice from a Northland Regional Council Biosecurity Advisor before using herbicides in wetlands.
- » Water take – a certain amount of surface water can be taken for domestic and stock needs providing it has no more than a minor effect on a wetland or natural ecosystem.



2

Look, learn and plan

No two wetlands are alike; how they look and the plants and animals they contain will vary with local conditions (for example, soils, climate and water flow). Larger wetlands may include 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 raupō. Restore these "missing elements" first.
- » What would you like to see in the future?
- » What are your aims? Trapping sediment or nutrients? Attracting wildlife? A water source? Environmental reasons?
- » 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 to increase wetland size or function?
- » 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. The effects of climate change may also have an impact on your wetland.
- » 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 receive free help:



Talk to 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. Northland Regional Council may be able to provide copies of aerial photographs.

3

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. Any increases in water levels need to be done gradually to avoid adverse effects on the vegetation or natural ecosystem. 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.

Several things can damage a wetland's natural cycle of flooding and drying. They happen in 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 usual (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 (a small structure built across a river to control the upstream water level) are an effective way to manage water levels but require 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, such as an underground dam. An underground dam is a trench of compacted clay that prevents water from leaving the wetland underground. Contact regional council staff or Fish and Game for advice.



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'll need a resource consent.

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 – this will need consent. Areas of open water can be difficult to keep free of weeds 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 haven't been disturbed and that support native plants and animals. If you want to create open water, choose bare paddocks where water sits and make sure you create some gently sloping, irregular shorelines as well as areas of water three metres deep. This allows water birds, and particularly chicks and ducklings easy access to and from the water. Sloping shorelines provide habitat for wading birds while extending the belt of reeds and rushes growing around the edge. Fallen trees and stumps can provide suitable roosts. Avoid planting exotics such as water lilies which can take over and fill up open water.

You may require a resource consent for ponds in paddocks or wetlands, so check first with your district council and with us at regional council.

4

Keep stock out

Stock that venture into wetland areas will increase the 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 as well as prevent peat formation.

Fencing stock out will encourage plants to regenerate from natural seed sources, prevent stock getting trapped and may reduce the incidence of liver fluke. If you can, aim to protect not just the wetland itself, but also a buffer strip of 10-20 metres around it. Make sure your fencing is strong enough to keep cattle out.

The Northland Regional Council's environment fund may contribute to the cost of fencing wetlands on private land.



5

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. 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 and when to start the weed control. Remember, it may take several seasons to control a serious weed infestation.

For larger or more difficult infestations, or to control weeds in the water you may need to engage a weed contractor with a controlled substance license or grow safe certificate because only some herbicides can be used over water.

Pest willows

Pest willows were 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. Grey or pussy willows can rapidly form dense stands which crowd out native species. They spread large roots into the water – absorbing a lot of water, leading to the diversion of the natural flow of water. Grey willow produce seeds that spread easily by wind and water, meaning further growth elsewhere.

Not all willows are pests; some non-seed producing willows are currently recommended for erosion control. Contact Northland Regional Council if you think you have grey willow in your wetland.

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

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

Pussy willows can crowd out native species.



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 (the strips of land along the edges your wetland) will need to be managed to control weeds, and/or planted appropriately.
- » 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 near the surface of the water, so it decomposes in sunlit and well-oxygenated water.
- » Old drain tailings and earthworks in or next to wetlands are often colonised by weeds such as gorse, pampas and Mexican devil. Replant with appropriate native species such as raupō, harakeke or tī kōuka.

6

Provide 'extras' for wildlife

Extras for birds

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



Tui thriving in a wetland

Extras for fish

Provide 'extras' for fish to make sure they thrive in your wetland.



Black mudfish

Black mudfish, photo credit Rod Morris, www.rodmorris.co.nz

Make them feel at home

- » Provide logs and trees in the water for perching sites and shelter, as well as gentle, sloping banks for access and roosting areas.
- » Create bays and screens of plants for birds to hide behind.
- » Carry out regular predator control (for example, for rats, stoats and feral cats) throughout the year with more intensive control before and during the bird breeding season.
- » If your wetland is near a block of native bush or another wetland, consider linking them with a 'green corridor' of native plants.

Make them welcome

- » If your wetland is connected to a stream (or streams) at least 10cm deep, it should be accessible to most native freshwater fish.
- » Some native fish species spawn in estuarine areas and the young migrate upstream. Long stretches of fast-flowing or polluted water and hanging culverts can act as impassable barriers and stop fish from reaching your wetland. Strengthen or upgrade culverts to make sure your wetland is accessible. (This may require a consent. Get in touch with our Biodiversity Advisors).
- » Native fish need streams with clear water, shading and cover. Muddy water limits their vision and reduces their food supply of aquatic insects.
- » Add large logs for shelter.

7

Control animal pests

Most wetland birds are ground nesters or nest in reed platforms low to the ground – making them vulnerable to animal pests. Some wildlife such as paradise shelduck will respond positively to a basic improvement in wetland habitat. However, other species such as pāteke and Australasian bittern will require additional help, particularly the control of animal pests.

Some animal pests in wetland areas include:



Setting traps to control pests

- » Possums, hedgehogs, stoats, weasels, ferrets, cats and rats. They take birds’ eggs, and most will also eat chicks and some adult birds.
- » Rabbits, hares, goats and possums eat wetland plants.
- » Dogs can harass and kill wetland birds. If dogs are an issue, consider wire net fencing to discourage them from entering the wetland and provide a more secure area for birds to nest.



Contact Northland Regional Council for practical advice and fact sheets on the best animal pest control methods for your situation.

8

Start planting

Prepare a planting plan

Plant appropriate species in your wetland. Plants such as raupō don't grow in low fertility peat bogs, so seek advice to find out what type of wetland you have. Common plants such as mānuka, 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:

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



Start by spending some time observing 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. The guide on page 25 includes a small sample of potential species for each zone and fertility type. Not all will be suitable for your area or situation. Coastal and upland areas, in particular, have their own species associations.

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

Ecosourcing

Ecosourcing means planting appropriate native plants from locally sourced seeds which come from close to your wetland. Generally, sourcing plants from within your local area or ecological district is acceptable. Local plants are usually adapted to local conditions and grow the best. Many species are genetically variable from area to area even though they may look similar. Many nurseries sell locally sourced plants, so be prepared to shop around.

You can 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.

Timing

In wet areas, around the water's edge and in shallow water, plant in summer (provided there are no drought conditions) 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 a native plant cover has developed.

Site preparation for planting

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.

Protect your natives

Remember, native plants don't tolerate grazing by stock – protect your investment by keeping stock out at all times.

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

When planting:

- » Choose sites suitable for 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 space.
- » Planting at least one plant per square metre saves work clearing or replanting later and reduces weed control work.
- » 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 around the roots.
- » 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 autumn or winter.
- » 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 30cm high, to give their roots time to get used to the saturated soil. Plant wettest sites during summer.



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

9

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. Further weeding can be reduced by using mulch or mats (for example untreated wood chips, compost, cardboard, wool carpet, old non-rubberised carpet and underlay or rotted hay) that eventually decompose. Pests such as rabbits and possums should also be controlled, particularly early on.

» For more information on pests you can visit Northland Regional Council's pest control hub. www.nrc.govt.nz/pest-control-hub

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 plants should take care of themselves.

Herbicides

There are only certain herbicides registered for use on and in 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.

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



Check our planters handbook for Northland natives for more information on local plants.



Sundew
(Drosera)

More planting tips:

- » The best time to plant in really 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 less likely to be uprooted by pūkeko.
- » When planting the dry edges of wetlands, use mulch at least 10cm deep. This can be untreated wood chips, compost, cardboard, wool carpet, 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 mānuka as nursery plants to provide shade for seedlings underneath.
- » Plant natives such as coprosmas which attract birds. Birds assist natural regeneration by spreading seed.

10

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've achieved and what additional plants and animals arrived naturally as your wetland recovered. A monitoring programme will help determine the success of your restoration. You can contact Northland Regional Council for more advice. Landcare Research also has a resource in the Wetland Handbook for monitoring wetlands.

11

Protect your investment

You can protect your investment of time and energy by placing a covenant on the site. This means you and subsequent owners retain ownership and control, but the wetland is protected forever. There are several different kinds of covenant. See page 31 for more details.



Horned orchid

WETMAK Landcare Trust. Wetland monitoring and assesment is available. (See further info page 30)







A guide to plants for wetlands in Northland

BOTANICAL NAME	COMMON NAME (Application and comments)	HIGH FERTILITY: swamps, floodplains, marshes, seepages, ponds, riparian			
		Shallow water >30cm	Shallow water <30cm	Edges: Damp	Edges: Banks
<i>Alectryon excelsus</i>	titoki (banks, floodplains)				√√
<i>Apodasmia similis</i>	oioi (saltmarsh)				
<i>Astelia grandis</i>	mauri (rare in wild)				√
<i>Austroderia fulvida</i>	toetoe (river banks, swamp edges)			√	
<i>Blechnum novae-zelandiae</i>	kiokio (common)			√√	√√
<i>Bolboschoenus fluviatilis</i>	kukuraho, marsh clubrush, purua grass				
<i>Carex flagellifera</i>	Glen Murray tussock, trip me up			√	√
<i>Carex lessoniana</i>	pūrei (less common)			√	
<i>Carex maorica</i>	swamp sedge		√	√√	
<i>Carex secta</i>	pūrei, pūkio		√	√√	
<i>Carex virgata</i>	pūrei, swamp sedge		√	√√√	
<i>Carpodetus serratus</i>	putaputawētā				√
<i>Coprosma macrocarpa</i>	karamū (mostly near coast)				√
<i>Coprosma propinqua</i>	mingimingi		√	√	
<i>Coprosma rhamnoides</i>	coprosma (banks, floodplains)				√
<i>Coprosma robusta</i>	karamū (common)				√√√
<i>Coprosma tenuicaulis</i>	hukihuki, swamp coprosma		√	√	
<i>Cordyline australis</i>	tī kōuka, tī, cabbage tree		√	√	√√√
<i>Corynocarpus laevigatus</i>	karaka (banks, floodplains)				√√
<i>Cyathea dealbata</i>	ponga, silver fern (drier banks)				√
<i>Cyathea medullaris</i>	mamaku, black tree fern			√	√
<i>Cyperus ustulatus</i>	giant umbrella sedge, coastal cutty grass (common)		√	√√	
<i>Dacrycarpus dacrydioides</i>	kahikatea, whitepine (banks, floodplains)		√	√√	√
<i>Dianella haemata</i>	inkberry, swamp blueberry (gumlands)				
<i>Dianella nigra</i>	tūrutu, NZ blueberry, ink berry (banks)				√
<i>Dicksonia squarrosa</i>	whēki, harsh tree fern		√		√
<i>Eleocharis acuta</i>	sharp spike sedge	√	√	√	
<i>Eleocharis sphacelata</i>	kuta, kutakuta, tall spike sedge (lake edges)	√√			
<i>Ficinia nodosa</i>	wīwī, knobby club-rush				
<i>Freycinetia banksii</i>	kiekie (damp shelter/shade, gullies)			√	√
<i>Gahnia setifolia</i>	māpere, razor sedge				√
<i>Gleichenia dicarpa</i>	swamp umbrella fern, tangle fern				
<i>Hoeria populnea</i>	houhere, lacebark				√√
<i>Isachne globosa</i>	swamp millet (swamps often with raupo)		√	√	
<i>Isolepis prolifera</i>	sedge (common, indicates high fertility)		√	√√	
<i>Juncus edgariae</i>	wīwī, Edgar's rush			√	
<i>Juncus kraussii</i> var. <i>australiensis</i>	wīwī, sea rush				
<i>Juncus pallidus</i>	wīwī, giant rush (big common rush)		√	√√	

LOW FERTILITY: bogs, fens, gumlands		COASTAL: Margins, coastal wetlands, salt marshes, fens, gumlands		FEATURES : Seed, fruit, nectar or insects for birds, plant height & type		
Damp	Drier	Damp	Drier	Bird food	Max height / range	Type
				✓	10 - 20 m	tree
		✓✓		✓	1 m	rush
					1.5 - 2 m	herb
		✓			3 - 3.5 m	grass
					3.5 m	fern
		✓✓			2.5 m	sedge
			✓		2.8 m	tussock
					1.2 m	tussock
				✓	1.5 m	tussock
				✓	1 m	tussock
				✓	1.5 m	tussock
				✓	10 m	small tree
			✓✓	✓	10 m	small tree
				✓	3 - 6 m	small tree
				✓	2 - 3 m	shrub
			✓	✓	6 m	small tree
				✓	3 m	shrub
		✓	✓✓	✓	20 m	tree
			✓	✓	15 m	tree
					10 m	fern
			✓		20 m	fern
		✓✓			2 m	tussock
				✓	50 - 65 m	tree
✓	✓			✓	1 - 2 m	large herb
	✓			✓	1 m	large herb
					8 m	fern
					0.5 m	sedge
					1 - 2 m	reed
		✓	✓✓		4 m	sedge
					30 m	scrambler
	✓				3 m	sedge
✓	✓✓				2 m	fern
			✓	✓	8 m	tree
						grass
					0.9 m	sedge
					0.6 - 2.5 m	rush
		✓✓			0.3 - 1.2 m	rush
					2 m	rush

BOTANICAL NAME	COMMON NAME (Application and comments)	HIGH FERTILITY: swamps, floodplains, marshes, seepages, ponds, riparian			
		Shallow water >30cm	Shallow water <30cm	Edges: Damp	Edges: Banks
<i>Juncus planifolius</i>	wīwī, grass-leaved rush (tall, common)			√√	
<i>Kunzea robusta</i>	kānuka, rawirinui (common)				√√
<i>Kunzea linearis</i>	rawiri mānuka, kānuka (sand/sandy peat)				√√
<i>Laurelia novae-zelandiae</i>	pukatea		√	√	√√
<i>Lepidosperma australe</i>	square sedge				
<i>Leptospermum scoparium</i>	mānuka (plant in groups, common)		√	√	√√√
<i>Lobelia anceps</i>	NZ lobelia (small creeper)			√	
<i>Machaerina arthropylla</i>	wīwī, rush like sedge				
<i>Machaerina articulata</i>	jointed twig-rush (shallow water)	√√			
<i>Machaerina juncea</i>	sedge, swamp tussock twig rush		√	√	
<i>Machaerina rubiginosa</i>	wīwī, rush like sedge				
<i>Machaerina teretifolia</i>	wīwī, rush like sedge				
<i>Melicytus ramiflorus</i>	māhoe, whitey wood				√√
<i>Muehlenbeckia australis</i>	large-leaved muehlenbeckia (riverbanks)				√
<i>Muehlenbeckia complexa</i>	pōhuehue, wire vine				√
<i>Myriophyllum propinquum</i>	common water milfoil (shallow water)	√√	√√		
<i>Myriophyllum robustum</i>	stout milfoil (rare in wild)	√	√		
<i>Myrsine australis</i>	māpou, red matipo, matipo				√√
<i>Persicaria decipiens</i>	swamp willow weed (swamp beds, streams)		√	√√	
<i>Phormium tenax</i>	harakeke, flax (plant in groups)			√√√	√√√
<i>Pittosporum tenuifolium</i>	kōhūhū (banks, floodplains)				√
<i>Plagianthus divaricatus</i>	saltmarsh ribbonwood (estuarine)				
<i>Plagianthus regius</i>	mānatu, ribbonwood (river banks only)				√√
<i>Polygonum salicifolium</i>	swamp willow weed (swamp beds, streams)		√	√√	
<i>Podocarpus totara</i>	tōtara (common, dry banks)				√√
<i>Potamogeton cheesemanii</i>	red pondweed (shallow water, common)	√√	√		
<i>Schoenoplectus tabernaemontani</i>	kāpūngāwhā, kuāwa, lake club-rush	√√	√	√	
<i>Schoenus brevifolius</i>	wīwī, bog schoenus, the stabber (low fertility)				
<i>Schoenus tendo</i>	wīwī, kauri sedge (under manuka)				
<i>Sophora chathamica</i>	coastal kōwhai (east coast sites)				
<i>Sophora microphylla</i>	kōwhai (river and floodplain inland)				√
<i>Sparganium subglobosum</i>	mārū, burr reed (rare in wild)		√	√	
<i>Streblus heterophyllus</i>	tūrepo, milk tree (floodplains)				√
<i>Syzygium maire</i>	maire tawake, swamp maire (wet)		√	√	
<i>Triglochin striata</i>	arrow grass (very small)				
<i>Typha orientalis</i>	raupō, bullrush (common swamps)	√√	√√		
<i>Veronica (Hebe) stricta</i>	koromiko (river/swamp edge)				√√
<i>Weinmannia silvicola</i>	tōwai, tawhero (shelter, banks)				√

LOW FERTILITY: bogs, fens, gumlands		COASTAL: Margins, coastal wetlands, salt marshes, fens, gumlands		FEATURES : Seed, fruit, nectar or insects for birds, plant height & type		
Damp	Drier	Damp	Drier	Bird food	Max height / range	Type
					0.9 m	rush
					8 - 30 m	tree
					12 m	tree
					35 - 40 m	tree
	√√				2 m	sedge
	√√√			√	5 m	tree
		√				herb
√√					0.5 - 1.3 m	sedge
					0.8 - 2 m	reed
		√√			0.2 - 1.35 m	sedge
√√					0.3 - 1.2 m	sedge
√	√				0.3 - 1.1 m	sedge
			√	√	15 m	tree
						climber
			√	√		scrambler
						herb
						herb
			√√	√	6 m	tree
						herb
		√	√√	√	1.6 m	herb
					10 m	tree
		√√	√		2 m	tree
					17 m	tree
						herb
			√		30 m	tree
						aquatic
		√√			3 m	sedge
√	√√				1 m	sedge
	√√				1 m	sedge
			√	√	20 m	tree
				√	25 m	tree
					1 m	herb
				√	10 - 15 m	tree
					16 m	tree
			√			turf
					3 m	herb
		√	√		4 m	shrub
					15 m	tree

Further resources

You can contact Northland Regional Council's Biodiversity Advisors if you need advice or have any questions about your wetland.

For more resources that will help to ensure the success of your wetland restoration, see below.

Manaaki Whenua - Landcare Research - Wetland Handbook Series

The Wetland Handbook Series published by Manaaki Whenua - Landcare Research is a compilation of three handbooks highlighting restoration approaches through showcasing the relationships between people and their wetlands. The Handbooks are:

- » Wetland Restoration – a handbook for New Zealand freshwater systems
- » Te reo o te repo: The voice of the wetland
- » Te reo o te repo – kei konei tonu au: The voice of the wetland – I am still here

www.landcareresearch.co.nz/publications/wetland-handbook-series

Kiwi Coast

The Kiwi Coast is a collaborative initiative that links over 200 community-led conservation projects, iwi and hapū, schools, forestry companies, government agencies and organisations in the shared vision of restoring the health of our native forests, helping native wildlife thrive and increasing Northland kiwi numbers.

www.kiwicoast.org.nz

NIWA Taihoro Nukurangi – NZ Fish Passage

This guidance document sets out recommended practice for the design of instream infrastructure to provide for fish passage.

www.niwa.co.nz/freshwater/research-projects/new-zealand-fish-passage-guidelines



Northland Regional Council Pamphlet – A guide to fish friendly culverts

www.nrc.govt.nz/fishfriendlyculverts

Northland Regional Council Pest Control Hub

www.nrc.govt.nz/pestcontrolhub

NZ Landcare Trust – Wetlands Monitoring and Assessment Kit (WETMAK)

Sustainable land and water management through community engagement.

www.landcare.org.nz/resource/wetmak

Weedbusters

Weedbusters NZ is about people and communities protecting their local natural areas from invasive plants.

www.weedbusters.org.nz

Wetland Trust – The National Wetland Trust of New Zealand

The National Wetland Trust (NWT) is working to conserve and restore wetlands, and to increase knowledge, appreciation and understanding of the value of wetlands.

www.wetlandtrust.org.nz

Contacts for more information

You can contact Northland Regional Council's Biodiversity Advisors if you need advice or have any questions about your wetland.

For more resources that will help to ensure the success of your wetland restoration, see below.

Northland Regional Council

Freephone 0800 002 004
Email info@nrc.govt.nz
Environmental Hotline 0800 504 639

Whangārei: 36 Water Street, Private Bag 9021,
Whangārei 0148

Waipapa: Shop 9, 12 Klinac Lane, Waipapa, 0295

Dargaville: Ground floor, 32 Hokianga Road, Dargaville
0310
Phone 09 439 3300

Kaitiāia: 192 Commerce Street, Kaitiāia 0410
Phone 09 408 6600

QEII National Trust

The QEII National Trust aims to inspire conservation on private land throughout Aotearoa.

For more information www.qeii-nationaltrust.org.nz

Nga Whenua Rāhui

Ngā Whenua Rāhui Fund supports the protection of indigenous biodiversity on Māori-owned land while honouring the rights guaranteed to landowners under Te Tiriti o Waitangi.

For more information www.doc.govt.nz/get-involved/funding/nga-whenua-rahui

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.

For more information www.fishandgame.org.nz



Department of Conservation

Department of Conservation staff can provide advice on how to identify, maintain, protect, and where necessary, enhance conservation values.

For more information www.doc.govt.nz

New Zealand Landcare Trust

The New Zealand Landcare Trust empowers the communities we live and work in to focus on, and improve, the sustainability of our land and water quality.

For more information www.landcare.org.nz

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.

P 0800 002 004
E info@nrc.govt.nz
W nrc.govt.nz

Northland
REGIONAL COUNCIL 
Te Kaunihera ā rohe o Te Tai okearau