Northland REGIONAL COUNCIL
Te Kaunihera ā rohe o Te Taitokerau

He Mahere Pāmu mō Te Tiaki Wai

Freshwater Farm Plan

Te horopaki, ngā wero, me ngā uara o te riu hopuwai: Te wehenga whakahaere waimāori o Poutō

Catchment context, challenges and values: Poutō freshwater management unit

Te Ihirangi
Contents

How to use this document

This document provides information about the Poutō freshwater management unit (FMU). It enables you to understand the issues and challenges in the FMU and ensure they are recognised in your freshwater farm plan. It does not provide a template for creating your freshwater farm plan, but it provides guidance on the key things you need to think about as you prepare your plan.

The document is divided into four main sections:

1. **Overview** – This section provides an overview of the Poutō freshwater management unit (FMU) and a summary of the key challenges to freshwater quality in the FMU.

2. **Context and values** – This section gives you contextual information divided into easy-to-navigate subsections covering topics such as the topography, land use, soils, waterbodies, biodiversity, climate, and Māori iwi and hapū present in the FMU. Each subsection also identifies relevant community, tangata whenua, biodiversity or other values that you need to have regard to when preparing your farm plan.

3. **Challenges –** This section focuses on the challenges to freshwater in the FMU. Challenges are presented as subsections, each focusing on a specific challenge.

4. **Central government and regional council rules** – The document ends with a brief overview of relevant central and regional government rules and regulations.

Each section is important, so please ensure you check them all before preparing your farm plan. You can read the document from start to finish, or dip into the subsections as you need them.

This document is designed to be read either on a screen or as a printed copy. Links to further information, which provides more detailed technical information, are provided where relevant as you work through the document. If you are reading the document on a screen, simply click the direct links to find the additional information. If you are reading the document in print, look out for the arrow icon alerting you to online resources (see 'Abbreviations and interpretation' below). Type the URL beside the arrow icon into your browser to find an online resource library with all the further information links gathered in one place.

This document is designed to work alongside the Te Taitokerau CCCV viewer.

Abbreviations and interpretation

FDE	Farm dairy effluent
FMU	Freshwater management unit
ha	hectare
Land Unit	an area of contiguous or non-contiguous land with similar biophysical features. (definition from RMA Freshwater Farm Plan Regulations 2023)
MCI	Macroinvertebrate community index
TLI	Trophic level index
	Online further information resource

He Tirohanga Whānui Overview

The Poutō freshwater management unit (FMU) covers 30,500 ha. It covers the western side of the Poutō peninsula up to the bluffs at the northern end of Aranga Beach (Fig 1).

The FMU is separated into two surface water catchments:

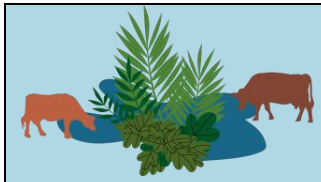
- Maunganui Bluff to Rehutai
- Poutō Peninsula extending south from Mahuta.

The FMU's rivers drain to the Tasman Sea, which affects coastal ecosystems. Along with the Tasman Sea, lakes and wetlands are the receiving environments for water in this FMU.

Figure 1: The Poutō freshwater management unit

Table 1: Summary of causes, impacts, and considerations relating to freshwater quality challenges in Poutō FMU

Challenges	Causes	Impact	Things to think about	Helpful map layers
 **Sediment in waterbodies, especially the dune lakes**	• Disturbance or exposure of erodible soils without sediment controls in place • Vegetation clearance in riparian areas and on steep / erosion-prone land • Unstabilised areas of gully and streambank erosion • Run-off or erosion from steep slopes • Cultivation close to waterbodies without filtering vegetation • Rainfall collecting sediment and discharging into waterways from drains and overland flow paths • Pugging/heavy stock • Stock access to waterbodies and immediate margins • Earthworks/farm races without sediment control • Poor drain management	Sediment in waterbodies means less soil on farm. Healthy soils have better production. Sediment in waterbodies affects freshwater plants and animals by smothering the lake or riverbed, reducing water clarity and plant growth. It can affect fish by reducing their ability to feed and clogging their gills. It makes water less appealing for recreation and for mahinga kai. It can mean water is not suitable for human uses, such as drinking, or that treatment costs for town supplies are higher. It affects coastal areas by smothering shellfish beds and reduces habitat quality for fish.	• What soils are on your farm? • What are your steeper areas of pasture and are they eroding? • What is your stock class, grazing intensity and rotation, especially in steep areas close to waterbodies? • What areas do not have riparian planting or filtering buffers? • What areas are high or low risk to cultivate? • How are you managing sediment from earthworks or races? • What areas are likely to result in sediment loss during heavy rain? • When do you undertake drain maintenance and to what extent? Where do you put the drain clearing spoil? • Are your lakes, streams and drains fenced and planted? • Can you reduce the sediment loads coming from your streams and drains?	• Fundamental Soils • Terrain: Slope Map • Landcare SedNet • Waterbodies

 **Faecal contamination (*E. coli*) and other pathogens in waterbodies**	• Stock in or near waterbodies • Poor management of critical source areas (e.g. stockyards, races/tracks and stock crossings) • Animal effluent disposal near waterbodies, drains or in overland flow paths • Frequently used unformed stock crossings • Soil compaction leading to overland flow	Faecal contamination can mean water is unsuitable for drinking or domestic uses and that rivers or lakes are unsafe to swim in. It can also make mahinga kai unsafe to consume and degrade the mauri of the water so it is unfit for cultural uses. There is a higher risk that people can get sick from water-based recreation.	• Do you have areas where stock can enter waterbodies or immediate margins? • What are the critical source areas and where do they discharge to? • What uses of water downstream of your farm that are sensitive to pathogens? • Do you have areas where effluent collects and washes into waterbodies? • Is your farm effluent system appropriately sized and designed? • Where and when are you irrigating effluent? Is it near waterbodies or overland flow paths and what is the soil saturation? • Is there effluent entering water from your stock crossings? • Are your drains, lakes and streams fenced? • Where are your flood risk areas that may increase animal effluent run-off into water?	• Rivers • Registered Drinking Water Supply Sites • Swimming Sites • Fundamental Soils • Flood Risk
	• Application of fertiliser, especially close to waterbodies • Urine from animals entering water or filtering through soils	Elevated nutrients increase the likelihood of algal blooms in waterbodies (especially in hot, dry periods). Algal blooms can be toxic, and reduce the suitability of the water for swimming, and	• Where and when are you spreading fertiliser and effluent – is the separation from waterbodies adequate? Are application rates appropriate for the soils on	• Fundamental Soils • Waterbodies

Elevated nutrients in waterbodies (especially dune lakes)	• Applying effluent close to waterbodies or at higher rates than soils can absorb • Applying fertiliser or farm effluent on 'leaky' soils (e.g. very sandy or free draining soils) in dune lake catchments • Soil compaction increasing nutrient run-off • Lack of filtering by vegetated riparian buffers	for collecting mahinga kai. Algal blooms can also block light, which reduces habitat quality and reduces nighttime dissolved oxygen levels to the point where aquatic animals can suffer or die. High nitrogen in drinking water negatively affects human health. Some native fish species are particularly sensitive to nitrogen.	farm? Are there areas of very free-draining soils? • Do you have stock in or near waterbodies? • How are you managing critical source areas for nutrient run-off (such as overland flow paths or stock crossings)? • How do your soils affect nutrient run off or uptake?	
 **Pest plants and animals** *One of the biggest threats to dune lakes and wetlands in Poutō is the introduction of pest fish and weeds.*	• Transport of pests by machinery from off farm (especially when used in drains or earthworks in or close to waterbodies) • Climate change is likely to increase the risk of pests	Pests can dramatically affect water quality and habitat value for native species. Pests can also affect infrastructure (e.g. water intakes) and the ability of people to use water for irrigation or drinking. Pests can reduce the recreational value of waterbodies.	• Ensuring machinery and equipment is clean before coming on farm, especially if working near waterbodies. • Reporting any unusual plants or fish.	

 **Riparian vegetation loss** *Many river, stream and lake margins no longer have riparian vegetation, which reduces the quality of habitats of aquatic native species, many of which are adapted to cooler shaded water and rely on vegetated margins for part of their lifecycle.*	• Stock accessing riparian areas • Vegetation clearance	Loss of riparian vegetation can mean higher water temperatures, (due to lack of shade) which can increase the risk of algal blooms and mean less suitable habitats for native species, which are often adapted to cooler, shaded water. Loss of ability of riparian vegetation to filter sediment, animal wastes and nutrients running off the land. Detrimental to native species, which often rely on vegetation next to waterbodies for breeding and feeding. Less vegetation can lead to more stream bank erosion, which increases sedimentation and can undermine fencing.	• Do you have areas where stock access riparian areas? • How far back are your fences from waterbodies? • Are your waterbody margins planted or maintained in long grass? • Are there areas next to waterbodies where you could plant or enhance vegetation for filtering and shading? • Do you have streambanks that are actively eroding? Could these be stabilised by planting?	• Waterbodies • Rivers
 **Wetland loss** *Approximately a fifth of the region was covered in wetlands but now only about 5% of our original*	• Drainage • Grazing • Earthworks • Pest plants	Loss of ecological functions such as sediment trapping and filtration of nutrients. Loss of habitat for native species. Increased flooding risk of areas downstream. Loss of drought resilience, as wetlands act like sponges that release water in dry periods.	• Do you have wetland areas? • Do you have areas that would work well as wetland restoration locations to trap runoff from critical source areas? • Are existing wetlands fenced? • Are your wetland water levels impacted by surrounding drains? • Do you know the pest weeds to look out for that could invade your wetland, e.g. royal fern?	Wetlands

wetlands remain (roughly half the national average)			• Do you ensure that all equipment brought in from off farm is clean to minimise the chance of introducing plant pests? • Are you doing pest control in or around any wetlands on your property?	
 **Changing climate**	• Increasing annual temperatures • More extreme weather events	Drought leading to increased risk of erosion on hill slopes. Reduced water levels in waterbodies, meaning contaminants are less diluted. Flooding leading to more nutrients, sediment and *E. coli* being transported into waterbodies. Sedimentation in waterbodies from soil eroded by flooding, collapsed banks as water levels rise. More frequent algal blooms due to higher water temperatures.	• When and where are you disposing of farm dairy effluent? • Are there areas next to waterbodies where you could plant or enhance vegetation for filtering and shading? • Do you have steep slopes or banks around waterbodies where you could plant to reduce sediment or nutrients?	Flood Risk

Te Horopaki me Ngā Uara
Context and values

Land and land use

The topography of your land and how you use it influences your farm's potential impact on freshwater quality. You need to keep these things in mind as you identify risks and consider actions to take in your freshwater farm plan. For example, steep terrain is more prone to erosion, particularly if it has been converted to pasture – this can lead to poor water quality due to the resulting sediment, *E. coli* and nutrient runoff. In free-draining areas, nitrogen from fertilisers affects waterbodies.

The catchments and rivers in the Poutō freshwater management unit (FMU) drain to lakes and the Tasman Sea. Most lakes in the Poutō FMU are dune lakes. They are particularly sensitive to sediment and nutrients.

Topography

The Poutō FMU generally has flat to rolling topography.

Most of the FMU has a slope less than three degrees. These areas are mainly inland low sloping dunes and beach flats. There is a steeper dune range running north to south alongside the beach. Due to the small catchment areas and sandy soils, there are few large watercourses. Many smaller streams only flow intermittently.

Slope is a key driver of erosion risk, as are soil type, geology and vegetation type, and this should be a focus of your risk assessment for your freshwater farm plan. The Te Taitokerau CCCV viewer includes maps of land considered prone to erosion.

www.nrc.govt.nz/CCCVResources

The Te Taitokerau CCCV viewer can indicate the slope of the land on your farm. If you want a more detailed breakdown of the slope or aspect on your farm, Landcare Research - Maanaki Whenua have a useful tool to assess these.

Landcare Research – Maanaki Whenua slope tool

www.nrc.govt.nz/CCCVResources

Land use

Much of FMU is used for beef farming, with plantation forestry in the south.

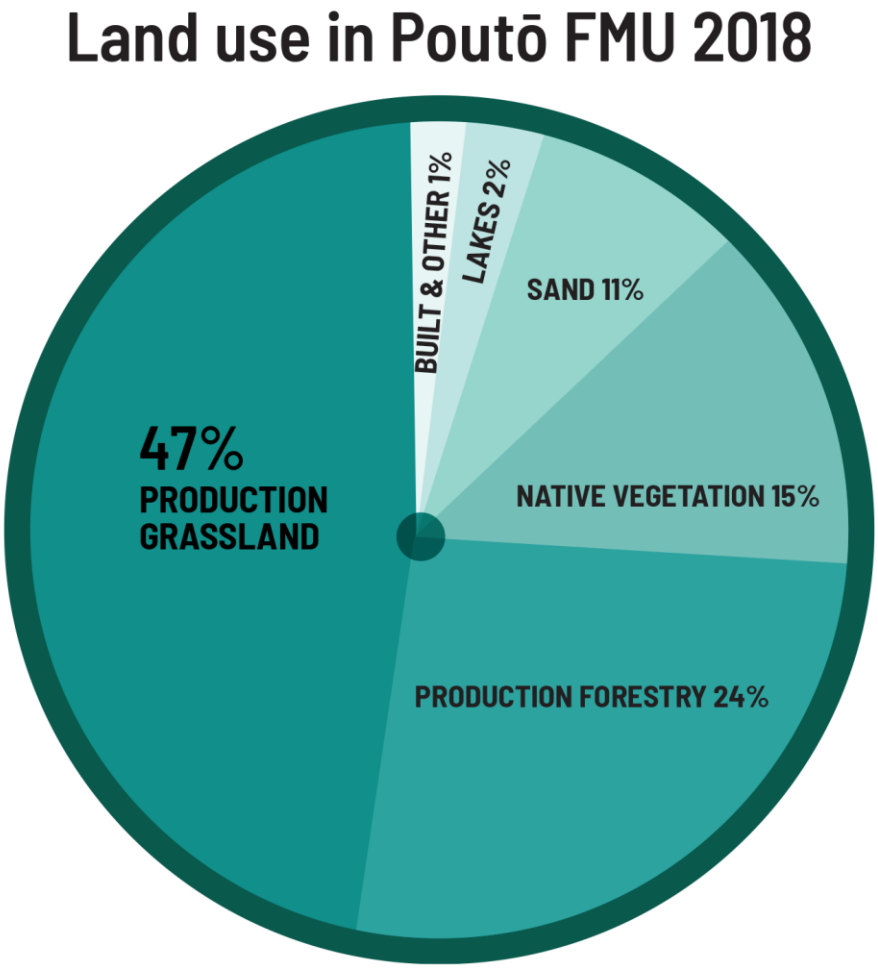


Figure 2: Land use in Poutō FMU (2018)

There are areas of native vegetation, such as the Poutō Wildlife Refuge and Omamari Government Purpose Wildlife Management Reserve. Lake Taharoa, Lake Kai Iwi and Lake Waikare are within the Taharoa Domain Recreation Reserve.

Indigenous habitats in the FMU have suffered extensive loss and modification mainly due to historical land clearance for agricultural activities or forestry. The FMU still contains areas of indigenous forest, shrubland, wetlands, dune lakes and dunelands.

Soils

The Poutō freshwater management unit is dominated by sandy soils. The coastal soils are young, becoming more mature as you move inland. Sandy soils are drought prone, tend to leach fertiliser and farm effluent, and are susceptible to wind erosion.

When you produce your freshwater farm plan, think about the type of soil you have on your farm and what you need to do to address the risks associated with it. Bear in mind that individual farms may have different soils across them. The Te Taitokerau CCCV viewer identifies soil types.

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Soil types

Recent sands

Recent sands are young soils formed on stabilised coastal dunes. They are extremely well-drained and lack fine particles, resulting in very low water-holding capacity and high susceptibility to drought and nutrient loss. These soils have weak structure and low organic matter, making them vulnerable to wind erosion and disturbance.

Maintaining dense vegetation is essential to build organic content and prevent soil loss. Cultivation should be minimal to protect the fragile structure. Despite their limitations, they can support plant growth and are sometimes used for wintering livestock with careful management.

Mature sands

Mature sands are older, consolidated coastal dune soils that have developed topsoil and subsoil layers. They are typically drought-prone with weak structure, low water and nutrient retention, and are highly variable across the landscape. Some areas have iron pans or podzolised layers that impede drainage. These soils are vulnerable to wind and gully erosion, especially when subsoils are exposed.

Maintaining dense vegetation is essential to build organic matter, reduce erosion, and improve structure. Cultivation should be minimal to avoid compaction and dust formation. Careful land use planning is needed to manage their fragility and variability

Very old podzol soils

Very old podzol soils, also known as gumland or pipe clay soils—developed under kauri forests and can be formed from various parent materials like sands, mudstones, sandstones, and volcanic rocks. They have thin topsoils above a pale, strongly leached, acidic, and poorly structured, silica-rich pan. Beneath this, is the dark layer where organic matter and minerals such as iron have accumulated. These soils are prone to severe gully erosion, compaction, and seasonal extremes being wet in winter, hard in summer.

Management includes careful winter grazing, maintaining dense pasture to build organic matter, and using no-till methods. Erosion-prone areas benefit from willow planting in gullies and retiring vulnerable land.

Old semi-volcanic soils

Old semi-volcanic soils, formed from deeply weathered volcanic rocks like basalt, breccia, and scoria mixed with sedimentary material, are found on rolling to steep terrain. These soils are strongly leached, acidic, and low in fertility. Shallow, friable topsoils can become drought-prone, while dense, sticky subsoils are poorly drained and rich in iron and aluminium oxides. This makes them prone to compaction, pugging, and erosion—especially sheet erosion and slumping on slopes.

Management includes maintaining dense pasture, avoiding overgrazing, and using no-till practices. In erosion-prone areas, planting poplars or willows and retiring marginal land helps stabilize slopes and reduce sediment loss.

Young semi-volcanic soils

Young semi-volcanic soils, formed from weathered volcanic rock, ash, and sedimentary material, are found in upper catchments. They range from fertile loams on gentle slopes to erosion-prone clays on steep terrain. Topsoils are friable and granular but dry quickly, while subsoils are sticky and poorly drained, especially in compacted or steep areas. Erosion risks include sheet erosion on exposed slopes and deep slips.

Management includes maintaining dense pasture, avoiding overgrazing, and using subsurface drainage. On steep or marginal land, retiring areas from grazing and planting erosion-control trees like poplars helps reduce degradation and protect waterways.

Peaty sand

The flat lowland parts of the FMU may comprise peat soils. Organic peat/sandstone soils are found near sand dunes or low-lying basins and are formed from a mix of peat and windblown sand. They are rich in organic matter but strongly acidic and poorly drained. They are fragile, prone to shrinkage, uneven surfaces, and drainage issues when over-cultivated, especially in dry conditions. Periodic flooding can add nutrients, but it can also smother these areas with a thick layer of structureless, unproductive silt or sand. These soils are heavy and slow to warm in spring. A key risk is the formation of a hydrophobic dust mulch. Erosion threats include gully and wind erosion.

Management includes avoiding over-cultivation, maintaining vegetation cover, managing drainage with wide, shallow drains to prevent peat shrinkage. In erosion-prone areas, paired willow planting is recommended, along with wetland preservation and strategic track placement to avoid creating wind tunnels. These soils can be highly productive when well-managed, but poor management can lead to soil loss and weeds. Over-draining or cultivation can cause irreversible soil shrinkage and oxidation in peat soils.

You can find more information about soil types and how to manage them in our Soil Fact Sheets.

Soil fact sheets

www.nrc.govt.nz/CCCVResources

Drainage

The Poutō FMU soils are very well drained. This increases deep drainage and reduces overland water flows. These subsurface flows can transport nutrients, such as nitrogen and phosphorus, into dune lakes or groundwater.

Artificial drainage

If you have drains on your property you need to consider when and how you undertake drain maintenance to reduce sedimentation and if can you exclude stock from the drains.

Drains can transport sediment and nutrients directly into dune lakes. The Poutō dune lakes are particularly sensitive to nutrients and sediment as they do not ‘flush’ like rivers. *Once in the lake, these pollutants stay there.*

High levels of nutrients (e.g. nitrogen and phosphorus) can result in algal blooms in lakes, especially in warmer weather. These affect water clarity and dissolved oxygen levels. Ultimately, they reduce recreational values and impact aquatic native plants and animals.

Artificial drains can also be a source of introduced pests if equipment used to clean them is contaminated. Equipment brought in from off-farm is particularly risky and can spread pests between areas.

Waterbodies

There are lakes, wetlands, and rivers (most are intermittently flowing) in the Poutō freshwater management unit (FMU).

Groundwater (aquifers) are also a key feature in the FMU and are commonly used as a water source. Several Poutō dune lakes are connected to groundwater. The state of groundwater affects these lakes.

Good water quality translates into high biodiversity of healthy indigenous plants, insects, fish, and bird life, which are essential to support community values such as collection of food and aesthetic value. A healthy freshwater environment is valuable for tourism, swimming and general public wellbeing.

Lake Taharoa in the Kai Iwi Lakes is the main freshwater swimming location in the FMU. It is the only lake within the FMU monitored for swimming water quality. Glinks Gully, Baylys Beach and Omamari Beach are also popular coastal swimming locations that are significantly influenced by freshwater quality in the FMU. For current swim suitability you can use Safeswim or Land Air Water Aotearoa's Long term recreational swimming site information. These are available through the Te Taitokerau CCCV viewer, or you can access the direct links below.

Safeswim

www.nrc.govt.nz/CCCVResources

Some monitored swim sites include:

- Lake Taharoa
- Coastal swimming sites at Baylys Beach, Omamari Beach, and Glinks Gully

Long term recreational swimming site information

www.nrc.govt.nz/CCCVResources

It is important to recognise the community values associated with water quality and understand how your farming activity can affect them.

Rivers and lakes

Rivers in the FMU are small and many flow intermittently because of the free draining sandy soils and small catchment size. Because of this, Northland Regional Council does not monitor any rivers in Poutō FMU. The rivers drain to lakes or the Tasman Sea.

Most lakes in the FMU are dune lakes supporting native plants and animals uniquely adapted to these rare habitats. These include:

- the dune lake galaxias and dwarf īnanga – rare freshwater fish found only in some Northland dune lakes

- a unique range of native algae and aquatic plants, including some of the last remaining habitat for a tiny critically endangered native waterlily – *Trithuria inconspicua* – which was voted NZ's Favorite Plant 2024, and many others that are threatened because there are few lakes left with good water quality
- threatened and rare water birds.

Some of our Northland dune lakes are the most pristine in New Zealand. Lake Taharoa is one of the largest and deepest dune lakes of its type in the world and until recently had the deepest growing submerged vegetation in the North Island, at 24 metres. Lake Waikare now has the deepest submerged vegetation in the North Island.

Dune lakes are very sensitive to activities in their catchments that can impact water quality, such as:

- earthworks, cultivation, vegetation clearance or drainage that result in sediment entering lakes
- elevated nutrients due to fertiliser use or farm effluent discharges.

Most dune lakes have no outlets, which means that any contaminants and extra nutrients, especially phosphorous, stay in the lake. This is known as nutrient loading. Shallow lakes with high loads of nutrients in their sediments are vulnerable to algal blooms.

Council monitors water quality in four dune lakes and ecological health in five dune lakes.

Lake Karaka, Lake Mokeno and the Kai Iwi lakes (Taharoa, Waikare and Kai Iwi) are identified as Outstanding Freshwater Bodies in the Regional Plan because of their ecological, cultural, and recreational values. Outstanding Freshwater Bodies are mapped in the Te Taitokerau CCCV viewer.

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The Northland Regional Plan applies rules specific to Outstanding Freshwater Bodies, including:

- activities in the beds of lakes and rivers (Section C.2)
- damming and diversion of water (Section C.3)
- land drainage and flood control (Section C.4)
- taking and use of water (section C.5)
- discharges to land and water (Section C.6)
- land disturbance (Section C.8).

Table 2: Outstanding lakes in the Poutō FMU

Lake	Description
	**Lake Karaka** is near the west coast on the Poutō Peninsula. The lake is 11.1 ha in size and 5.4 metres deep. The immediate catchment is pastoral (25%), and flax/sedge/raupō wetlands (75%) that extend to the north and south of the lake, linking it with other water bodies with mobile sand dunes at the western end. There are no inflow or outflow streams. The lake and extensive wetland areas provide outstanding habitat for water birds including *matuku-hūrepo* (bittern), banded rail and spotless crake. Longfin eel and īnanga have also been recorded. The lake has high ecological value although it has experienced algal blooms from nutrient enrichment and the invasive plant hornwort has established – both of which impact on ecological values and ultimately water quality.

	**Lake Mokeno** is 148.3 ha in size making it the largest Poutō lake. It is 6.1 metres deep and is located near the west coast. It is surrounded by native scrub and wetlands, with pine forestry in its upper catchment. It is set in a wetland/scrub/dune complex covering the south-western Poutō Peninsula, which contains nationally significant populations of endangered species. Nutrient inputs from land use in the catchment and potentially groundwater has led to an enriched (supertrophic) water quality causing algal blooms and loss of most submerged vegetation. It has declined from outstanding ranking to high-moderate ecological value.
	**Taharoa** At 197ha, Taharoa is the second largest and the deepest lake (37 metres) in Northland. It is in a catchment comprised of approximately 1.8 million year old consolidated, nutrient-poor, sand dunes with shrub land, pastoral land and planted forest. It is popular for boating, swimming and water skiing. There are two minor inflows at the south-west end of the lake, with no outflow. 70% of the lake's water comes from rainfall. Lake Taharoa has outstanding ecological value. Threats include nutrient enrichment and the risk of invasive aquatic plants, fish and invasive gold clams being introduced by the public.
	**Waikare** is a 26.5ha and 30 metre deep, native plant dominated lake. The presence of nationally rare plants and fish and negligible impact by pest plants means this lake is ranked as outstanding ecological value. The at-risk naturally uncommon dune lake galaxias (restricted to the Kai Iwi Lakes) appears to be abundant in Lake Waikare. The critically endangered tiny native waterlily (*Trithuria inconspicua*) grows in its shallows. There is no outlet, and only minor drains enter the lake. There is a high risk of pest plant introduction given relatively easy access. Nutrient enrichment also poses a threat, particularly as this could lead to increased likelihood of pest plants establishing.
	**Kai Iwi** is 22.6 ha in area and 16 metres deep. The lake margin is predominantly scrub (70%) and logged pine plantation (30%), with pasture in the larger catchment. The lake is dominated by native plants, including nationally rare plants. The lake is home to the largest remaining population of the critically endangered tiny native waterlily (*Trithuria inconspicua*). Only one pest plant species is present (*U. gibba*). The isolated nature of much of this lake and extensive emergent and scrub vegetation provide good habitat for water birds. While it has outstanding ecological value, water quality trends show increases in chlorophyll a (planktonic algae) and total nitrogen with decreased water clarity. The key threat is declining water quality due to nutrient enrichment.

There are other dune lakes in the FMU. For more information, see:
Lake reports for Poutō Lakes and North of Dargaville Lakes

www.nrc.govt.nz/CCCVResources

Wetlands

The FMU hosts a variety of wetlands with significant ecological and recreational value. Wetlands are home to many threatened plant and animal species.

In the past, wetlands in Northland covered approximately 258,451 hectares, or 32 percent of the land area. Today, only 5.5 percent, or 14,114 hectares, of the original wetland area remains. Many of

these lost wetlands were unique and irreplaceable. Wetlands (repo) are highly valued by Māori for a range of reasons including as a source of mahinga kai, traditional materials and medicines.

Wetlands are important because they can:

- improve water quality by removing contaminants before they enter the wider catchment
- mitigate extreme weather conditions such as flooding, by slowing down flow of water; and drought, by releasing water slowly over time to maintain water flows
- trap topsoil erosion, preventing it from entering the dune lakes and other water bodies
- help filter nutrients from fertilisers, chemicals, and animal wastes
- provide biodiversity hotspots and be highly valued by the community for cultural and recreational reasons (for example, tuna/eels and gamebird hunting). Eels and freshwater crayfish thrive in some wetlands. Wetlands are home to threatened species such as bitterns and native plants.
- reduce downstream flooding in high rainfall by absorbing water and slowing the flow into lower flood prone areas.

Table 3: Significant freshwater wetlands (excluding wetlands in lakes)

Significant freshwater wetlands	Description
Poutō Dune System	This wetland system is the best and most pristine example of a dune system with wetlands in New Zealand and is one of the most extensive. It contains freshwater wetland vegetation types from coastal dunes to inland freshwater lakes. It supports a high number of threatened bird species including the threatened – nationally critical grey duck and *matuku-hūrepo* – Australasian bittern.
Glinks Gully Wetland	This approximately 60ha swamp is part of a sequence of predominantly indigenous vegetation and supports two threatened and three at-risk species.
Omamari Wetland	This 85ha swamp has four wetland vegetation types including harakeke (flax), sedge and raupo and contains a good example of freshwater vegetation grading into manuka shrubland on adjacent hillslopes. It is relatively weed free and provides habitat for two threatened species, five at-risk species, and three regionally significant species. A portion of the site is protected as a Wildlife Management Reserve administered by the Department of Conservation.

For more information:
Looking after your wetland

www.nrc.govt.nz/CCCVResources

Restoring wetlands and their ecological functions is essential for sustainability, benefiting both farming and indigenous biodiversity in the FMU. Even small wetland areas can improve biodiversity and act as a filter for sediment and nutrients. Restoration efforts may include:

- stock exclusion
- pest and weed management
- ensuring machinery and equipment is clean of introduced plant and animal pests before bringing it on-farm
- reporting unusual plants or fish that may be introduced pests
- creating new wetlands.

If you have a wetland on your property, your freshwater farm plan needs to consider your contribution to restoration efforts. Creating wetlands is also a way to reduce contaminant loss from your farm and improve water quality and aquatic biodiversity.

Biodiversity

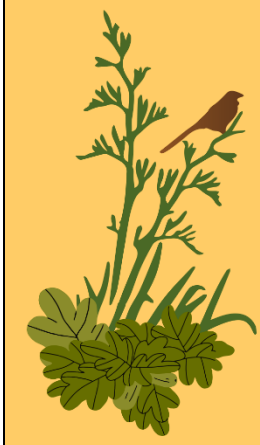
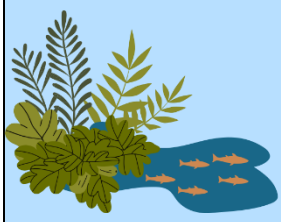
Waterbodies of the Poutō FMU host a diverse and unique biodiversity (see table). You can find the conservation status of a species in the New Zealand Threat Classification System (NZTCS). You can also access current NZTCS reports. The NZTCS website has links to other data sources, such as the NZ Freshwater Fish Database.

While public conservation land supports a significant proportion of the FMU's indigenous biodiversity, some of the habitat occurs in the rural landscape, and many of the mobile species rely on habitat and connectivity through farms. Ducks, grebes, rakes, fish, freshwater mussels and aquatic insects are found in Poutō waterbodies.

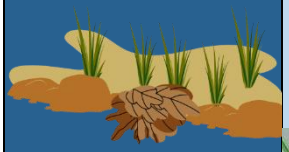
Table 4: Significant biodiversity in the Poutō FMU

Birds[1]	Characteristics	Habitat	Threat
Australasian bittern - Mataku hūrepo *Nationally critical (highest threat status), 250-1000 remaining* 	Apex predator. Shy, camouflaged and spend much of their time hidden in dense aquatic vegetation. 	Poutō lakes. Wetlands lakes, slow moving streams, farm drains, ponds and paddocks.	• Drainage of wetlands. • Loss of indigenous vegetation around lakes and wetlands. • Non-farm threats include hunting and predation by invasive species. • Nests on lakes are vulnerable to disturbance by boats, jet-skiers and water-skiers.
Banded rail *At risk – declining* Source: DOC  *Photo credit: JJ Harrison - jjharrison.com.au*	Consume snails, crabs, insects, worms and spiders or dead fish, seeds, and fruit. 	Poutō wetlands and dune lakes.	
Dabchick *Threatened - Nationally increasing*  *Photo credit: Duncan Watson, New Zealand Birds Online*	Consume aquatic insects, fish, crayfish, shellfish, leeches. Good divers. 		
Spotless crake Pūweto *At risk – declining*  *Photo credit: Paul Le Roy, New Zealand Birds Online*	Very secretive and largely crepuscular. Consume seeds, fruit, plants, worms, snails, spiders, beetles. 		

[1] More information at New Zealand Birds Online

Fernbird *Regionally significant*  *Photo credit: Ormond Torr, New Zealand Birds Online*	Insectivorous, well-camouflaged birds. 	Dense low vegetation in wetlands.	
Caspian tern *Nationally vulnerable* *2,600 remaining*  *Photo credit: Les Feasey, New Zealand Birds Online*	Outside of breeding seasons it feeds in dune lakes on pelagic fish. 	Dune lakes and Poutō coast.	Caspian tern abundance relates to health of the dune lake biodiversity.
Other animals	**Characteristics**	**Habitat**	**Threat**
Dune lake Īnanga or dwarf inanga *At risk – declining. Found in only 13 lakes. Does not coexist with any other galaxiid species.* 	Entire life cycle in dune lakes - landlocked. Use several species of grasses to deposit their eggs. Healthy lake vegetation, marginal reed beds and water quality are important for the population's survival. 	Dune lakes.	Water levels must be sufficient to inundate the grasses at the correct height for the eggs to hatch.
Freshwater mussels - Kākahi/torewai	Filter feeders. Indicators of ecosystem health. Kākahi use their foot to move around, anchor themselves	Habitats ranging from small, fast-flowing streams to lakes.	• Loss of habitat. • High nutrient levels. • High sediment levels.

Threatened, declining. 	and burrow into sediment. 		
Native insects ***Source Manaaki Whenua*** 	Food sources for fish and birds. 	Lake and streamside vegetation. In-stream and lake habitat complexity and stability are important for their lifecycles.	
Plants	**Habitat**	**Characteristics**	**Threat**
Marsh fern ***Source NZPCN*** *At risk – naturally uncommon* 	Surrounding many of the dune lakes - Poutō is the national stronghold of this species and in Australasia. 	Often winter dormant and summer-green in cooler habitats. The fern grows amongst emergent species at the water's edge and in surrounding dune lake wetlands.	Invasive weeds.
[Tiny native waterlily] ***Trithuria inconspicua*** ***Source NZPCN*** ***Photo credit: Dennis Gordon - https://creativecommons.org/licenses/by-nc/4.0/*** *Threatened – nationally critical. Has become extinct in seven dune lakes.* 	Unique to the sandy shores of the Northland dune lakes. It lives in the shallow water up to 2m deep. 	One of the oldest flowering plant lineages. New Zealand's Favourite Plant in 2024.	• Poor water clarity. • Introduced species such as bladderwort and oxygen weeds outcompete the plant.

Sand spike sedge **Source NZPCN** **Photo credit: Lisa**  **Forester***At risk – declining*	Damp sand flats, often near streams or in places where freshwater filters through the sand at depth or where it is temporarily ponded. 	Small copper coloured sedge. Rhizomatous, widely creeping and mat-forming spike-sedge of damp sandy flats.	• Invasive weeds. • Vehicles driving over it.

Protecting and enhancing freshwater habitat and biodiversity on farms can lead to better water quality outcomes and falls within the whole-of-farm or integrated farm planning approach. Actions to consider include:

- fencing off waterbodies, wetlands and remnants of native bush
- stabilising eroding streambanks with vegetation
- planting shade species for exposed waterbodies
- planting and protection or creation of wetlands
- removing barriers to fish passage
- controlling pest plants and animals
- preventing the spread of pest plants and animals between lakes and wetlands
- improving or restoring connections between native bush, wetlands and waterbodies.

Climate

Climate is a major influencer of risks and impacts, and it needs to be considered when you write your freshwater farm plan. For example, high rainfall in areas with well drained soils can lead to higher levels of contaminants (from fertiliser or farm wastewater for example) leaching into dune lakes. Warmer temperatures combined with elevated nutrients in dune lakes means they are more vulnerable to algal blooms. Climate also impacts whether you have good grass cover going into winter, and the ability to leave adequate residuals to protect soils.

Temperature

In general, in the Poutō freshwater management unit (FMU), summers are warm and humid, while winters are mild with only a few light frosts each year. The average daytime temperature in nearby Dargaville, for example, ranges from 0-18°C in winter to 8-28°C in summer and there are up to 2,000 hours of sunshine annually.

Changes to our climate are projected to increase temperatures in the FMU by 0.5-1.0°C for all seasons by 2040. This may change the crops that can be grown and increase related pests and diseases. Higher temperatures might help crops mature faster, but they can also lead to lower yields due to droughts and floods. Extreme weather events could stress or even kill livestock and stir up sediments in shallow dune lakes, releasing nutrients that cause algal blooms. An increase in temperature harms freshwater environments. It can increase the risk or scale of algal blooms, which are detrimental to people, stock and freshwater plants and animals. It can help plant and animal pests to grow or breed more quickly. Shading streams is an important tool for reducing water temperatures.

Rainfall

Rainfall is generally plentiful throughout the year, with occasional downpours. Dry spells can occur, especially during summer and autumn. The FMU has a median annual rainfall around 1,100 mm, which is near the national median of 1,070 mm. Rainfall varies within the catchment, with the south receiving the least and the north receiving the most. Exposed areas can be very windy.

The FMU is prone to region-wide droughts and floods that affect farming and freshwater, and it sometimes experiences gales linked to tropical depressions.

It's important to adapt to temperature increases and rainfall changes, and you should plan for how to manage these in your freshwater farm plan. Actions to consider include:

- fencing off waterbodies, wetlands and remnants of native bush to allow plants to shade the waterbodies
- stabilising eroding streambanks with vegetation
- planting waterbodies and protecting or creating wetlands
- controlling pest plants and animals around waterbodies
- ensuring you have a water management plan during droughts
- providing shade for stock to reduce heat stress and water consumption.

Further information

NIWA has regional weather and climate information for Northland.
NIWA Northland weather and climate information

www.nrc.govt.nz/CCCVResources

Stats NZ has rainfall data.
Rainfall data

www.nrc.govt.nz/CCCVResources

Tāngata Whenua

The Poutō freshwater management unit (FMU) has areas of interest for several Te Taitokerau iwi. Māori have a long heritage in this FMU as kaitiaki over the waterbodies, taonga species, and preservation of kōrero toku iho (historical kōrero passed down through generations) and pūrakau (knowledge holders) that have shaped the cultural identity for each iwi.

Your freshwater farm plan needs to consider how to protect and/or enhance tāngata whenua values and sites of significance on your property, such as wāhi tapu (cultural and spiritual areas of significance) and wāhi tupuna (landscapes and places of significance) sites and areas for gathering māhinga kai (food sources) and habitats and freshwater migration pathways of taonga species.

For example, you may have an important waterbody that is a migratory pathway for tuna or banded kōkōpū on your farm. You might create an action to check any river crossings or culverts to make sure that they are compliant with fish passage rules, so migratory pathways are not compromised. This enhances cultural values like mauri and manaakitanga by ensuring that the whakapapa of these taonga can continue and your actions are looking after them and preserving their life.

Iwi of Poutō FMU

Many iwi have associations to the Northern Wairoa and iwi may have overlapping areas. Each iwi has significant ongoing interests in maintaining and restoring the health of freshwater and freshwater ecosystems of the FMU, as well as economic interests through land ownership.

Learn about iwi freshwater values and interests in online iwi story maps.

www.nrc.govt.nz/CCCVResources

Iwi for Poutō FMU are:

- Te Rūnanga o Ngāti Whātua
- Te Roroa
- Te Uri o Hau

www.nrc.govt.nz/CCCVResources

Indicative iwi boundaries can be found in the Te Taitokerau CCCV viewer.

www.nrc.govt.nz/CCCVResources

More information about formally recognised iwi groups

www.nrc.govt.nz/CCCVResources

Information resources

Statutory Acknowledgements
Treaty Settlements and the related Statutory Acknowledgements provide more detail on the specific connections that the respective hapū and iwi have with particular sites and places, as well as their historical associations with the entire catchment area.

Statutory Acknowledgement Document

Treaty of Waitangi statutory acknowledgement areas in the Northland Region

www.nrc.govt.nz/CCCVResources

In Poutō, Te Uri o Hau has a special relationship with the wāhi tapu (sacred areas) as many Te Uri o Hau tūpuna are buried there. There are many urupa (burial grounds) and taonga (treasures) beneath the whenua (land).

Traditionally the region was used extensively for gathering kai (food) and the freshwater lakes provided an abundance of kai.

Traditionally there were many nohoanga (temporary settlements) within Poutō. Whānau from the peninsula and from other marae around the Kaipara harbour would camp together catching tuna and kanae from the lakes and gathering birds, harakeke and berries from the wetlands and surrounding areas.

The mauri of this region represents the essence that binds the physical and spiritual elements of all things together, generating and upholding life. Mauri is a critical element of the spiritual relationship of Te Uri o Hau and Poutō, and to wai māori (freshwater).

Iwi and hapū environmental management plans (IHEMPS)
IHEMPS and other related iwi planning documents also provide useful information and direction as to when iwi and hapū wish to be consulted, what is of importance to them and their aspirations.

Iwi environmental plans:

- Te Uri o Hau
- Te Roroa

www.nrc.govt.nz/CCCVResources

Other useful resources

The New Zealand Archaeological Association maintains a website which is a good source of recorded archaeological sites.

The Regional Plan for Northland includes maps of some sites and areas of significance to tāngata whenua in fresh and coastal waters. None have been mapped in Poutō, but that does not mean they do not exist. Seek advice from tāngata whenua when developing your freshwater farm plan.

The resources provided in this document do not give a complete picture. It is recommended that you contact your local marae to enquire about sites relating to freshwater on your property, and for advice to help protect and enhance them. Visit Te Puni Kōkiri (Ministry of Māori Development) for contact information, or Te Kāhui Māngai and Māori Maps to find lists of representative groups for the iwi and hapū in your area.

www.nrc.govt.nz/CCCVResources

Sites and species of significance

Historical and archaeological sites, ancestral lands, waterbodies, wāhi tapu and other taonga are significant to Māori. There are numerous pa sites, terraces, pits and middens along the coasts, and further inland in some areas. Kaipara was one of the first areas settled by Māori in New Zealand.

Your freshwater farm plan should consider how your farming operations could affect sites of significance and how to protect them.

We are working to confirm sites of significance in Poutō. We will update this document with further details as soon as the information is available. If you need urgent assistance with identifying sites of significance to tāngata whenua in Poutō, please contact Northland Regional Council on 0800 002 004 or info@nrc.govt.nz

Kaipara Moana Remediation

Kaipara Moana Remediation (KMR) encourages and supports landowners and groups to take action to restore the mauri of the Kaipara Moana (harbour). It works in both Northland and Auckland regions, across more than 600,000 hectares that flow into the Kaipara Moana.

A small area of the Poutō FMU drains into the Kaipara Moana. Owners and managers of land in the Kaipara Moana catchment are eligible for funding to reduce erosion and sedimentation from their properties.

Check if your property is in the Kaipara Moana catchment.

KMR invests in action on the land to reduce sediment losses to nearby streams, rivers, estuaries, and coastal waters. Projects include restoring wetlands, fencing off and planting the margins of rivers and streams, and planting or regenerating forest on highly erodible land.

KMR provides free advice, walking the land with you to discuss your aspirations and project options. They prepare a plan to access KMR funding and provide support throughout the project. KMR can contribute to the cost of eligible sediment reduction projects.

For further information on how KMR can support you to improve the quality of local waterbodies and the Kaipara Moana, go to the Kaipara Moana Remediation website.

Ngā Wero Challenges

The key challenges for freshwater in the Poutō FMU are:

- high levels of sediment in waterbodies
- *E. coli* and other pathogens in waterbodies
- high levels of nutrients (phosphorous, and nitrogen) in waterbodies
- wetland loss, habitat loss, and loss of riparian vegetation
- the threat of aquatic pest plants and animals in dune lakes.

These are likely to be even more challenging under a changing climate. For a summary of these challenges refer to the table in Section 1. More detail on each of these challenges can be found below.

Identifying your on-farm risks, having regard to these challenges and the actions you can take to address them, should be priorities as you create your farm plan.

Consider where you are in the catchment. Dune lakes are particularly sensitive to nutrient and sediment, especially phosphorous, so activities within dune lake catchments need to be undertaken with care – especially drainage, cultivation/earthworks and the application of farm wastewater and fertilisers.

Northland Regional Council monitoring data for contaminants

Raw data (Environmental Data Hub)

www.nrc.govt.nz/CCCVResources

Sediment in waterbodies

Sediment entering fresh and coastal waterbodies is a widespread issue in Northland. In the Poutō FMU the main concern is sediment entering and accumulating in dune lakes. Phosphorous, which dune lakes are especially sensitive to, binds to sediment. Sediment reduces water clarity, which affects access to light for native aquatic plants and the ability of native fish and mussels *(kākahi)* to feed and breed. Sediment can also smother lake beds and the plants that live there. The soils of the Poutō FMU are frequently sandy and easily mobilised by wind and water. Sediment entering waterbodies from drains or run-off from exposed earth (e.g. earthworks, cultivation or vegetation clearance) are the key sources of concern. Heavy grazing and pugging can also lead to erosion, especially during high rainfall.

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Slope, soil type, and vegetation affect erosion risks. The Regional Plan maps identify 56% of the Poutō FMU as Erosion Prone Land, especially the dune systems on the western margins. Dunes and sandy soils are vulnerable to erosion by wind and water.

Erosion degrades both land and freshwater, as eroded materials end up in waterbodies. Heavy rain, land use practices, pugging from stock, low pasture cover, deforestation, and development-related disturbances make soil erosion worse, especially in hill country and stream banks. Managing land use is key to controlling erosion.

Your freshwater farm plan should consider the following sources of sediment and how these can be managed on your farm.

Table 5: Sources of sediment

Surface erosion This occurs when soil particles are detached from the surface and carried across the ground by water, wind or gravity.	
Fluvial erosion This happens when running water gouges shallow channels or deeper gullies into the soil. On sloping land, the gullies can cut deep into the subsoil or undermine the surrounding soils.	
Mass movement Otherwise known as slips, slumps or landslides, this is the most common form of erosion in hill country. It is most common after heavy rain.	

Faecal contaminants (*E. coli*) and other pathogens in waterbodies

E. coli comes from the excreta of warm-blooded animals and is an indicator of the risk of infectious disease from contact with freshwater. Key sources are run-off from farm animals, stock in waterbodies and discharges of human or animal effluent – wild birds and pest animals are also a common source in Northland. *E. coli* pollution from effluent discharges to water is unacceptable to tāngata whenua.

Faecal contamination is monitored at Kai Iwi lakes and the coastal sites of Omamari Beach, Baylys Beach, and Glinks Gully Beach. All sites usually have *E. coli* levels suitable for swimming.

Northland Regional Council has collated *E. coli* monitoring data and modelled estimated *E. coli* concentrations across the region.

E. coli monitoring data

www.nrc.govt.nz/CCCVResources

The council has commissioned research into the state and sources of *E. coli* in Northland. Research shows Northland rivers have high levels of *E. coli* that come from various pollution sources related to intensive land use. Modelled data for the Poutō FMU show most waterways have poor to very poor water quality.

Access the research

www.nrc.govt.nz/CCCVResources

When you create your freshwater farm plan, you will need to consider both diffuse and point sources discharges of *E. coli* in waterbodies. Diffuse sources are widespread or dispersed sources such as runoff from pasture and include (but are not limited to):

- rainfall/overland flow/run-off from pastureland, especially erosion-prone land in extensive or intensive land-use with high connectivity to waterbodies
- poorly drained lowland pasture (e.g., floodplains with shallow water tables)
- application of farm dairy effluent (FDE) to land, generating runoff from poorly drained or saturated soils.

Point sources are from a single fixed point, such as a pipe or drain or dairy shed outfall and include (but are not limited to):

- direct stock access to water bodies
- FDE discharges to water
- farm infrastructure/practices with high connectivity to waterbodies e.g., stock drinking troughs, races, wintering pads, stream crossings and the outfall of drains.
- storm water, storm water systems cross-contaminated with sewerage
- poorly constructed or maintained human wastewater systems.

Source tracking and *E. coli* monitoring in our region have shown that diffuse sources of *E. coli* from pastureland need prioritised management to reduce *E. coli* loads in waterbodies, with ruminants (cattle, sheep) typically being the dominant source of *E. coli* (but this can vary with location and land cover).

Stock exclusion by effective fencing, riparian planting and use of wetlands or detention bunds to intercept overland flow from *E. coli* sources are very effective in reducing faecal loads in waterbodies. Afforestation in highly erodible land and eliminating farm dairy effluent discharges to waterbodies are also encouraged to eliminate *E. coli* pollution.

Elevated nutrients in dune lakes

Dune lakes in the Poutō FMU are some of the rarest habitats in the world and support unique native plants and animals, some of which are found nowhere else. Northland dune lakes represent a large proportion of warm, lowland New Zealand lakes with relatively good water quality and limited pest impacts.

Dune lakes are especially vulnerable to elevated nutrients because they hold nutrients that run off from surrounding land uses and don’t flush like rivers. Nutrient enrichment can lead to eutrophication (accumulation of nutrients), which causes algal blooms that can affect habitats. Warmer temperatures due to climate change are likely to make dune lakes more vulnerable to algal blooms. Most of the monitored lakes on southern margins of the Poutō Peninsula are impacted by nutrients and are in fair or poor condition.

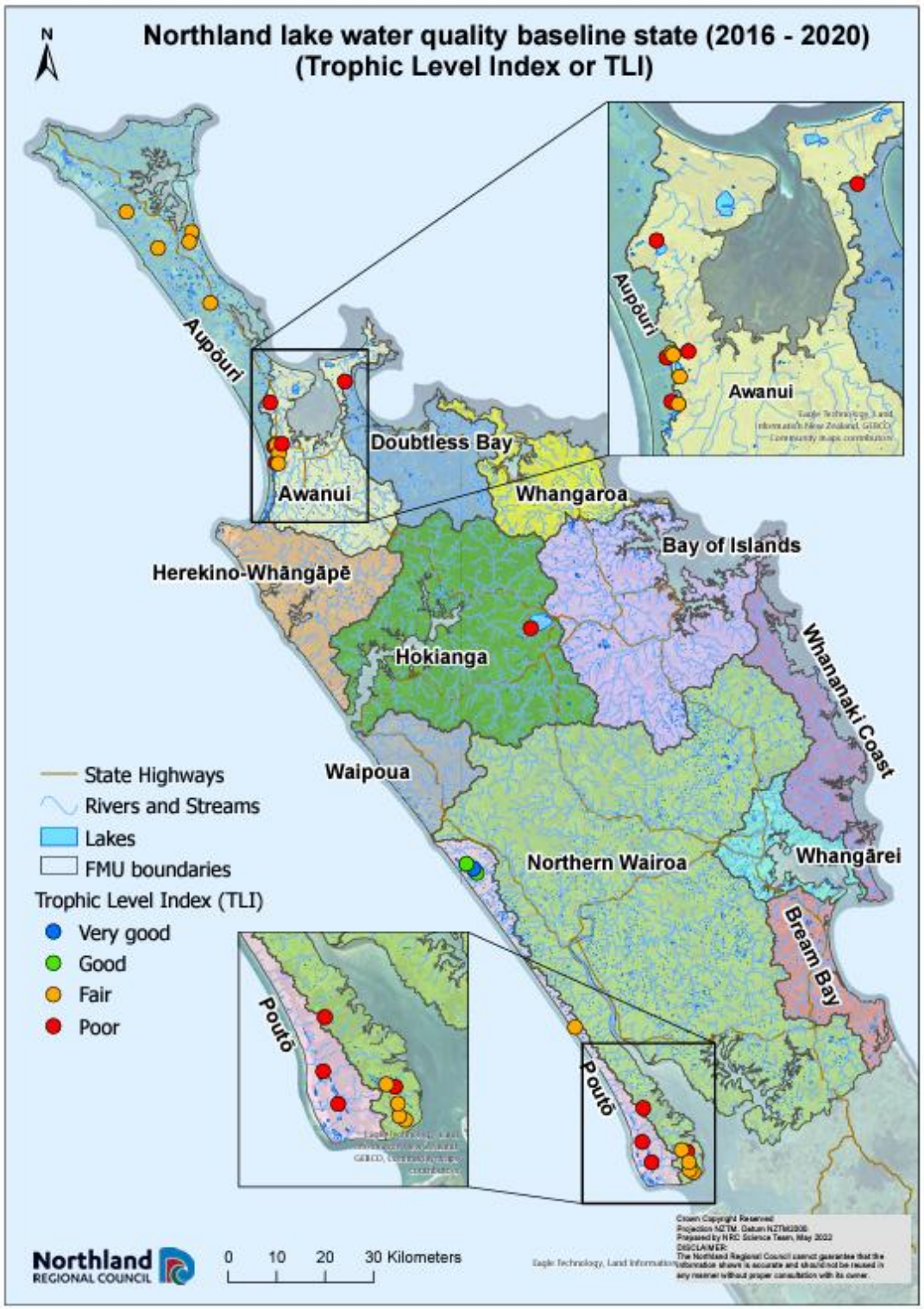

Figure 3: Northland lake water quality (2016-2020)

Activities like cultivation near lake edges and drains discharging to lakes can increase nutrient and sediment loads. The sandy soils in the Poutō FMU tend to 'leak' nutrients, which can filter through to groundwater rather than being trapped by heavy soils or used by plants.

You will need to consider this challenge in your freshwater farm plan. Think about:

- taking care when applying fertilisers
- managing farm wastewater carefully
- overland flow paths and drains, which are other critical source areas that can increase nutrients in dune lakes.

Wetland and habitat loss

Land use change, intensification, deforestation, drainage, reduced flows, pollution, sedimentation, nutrient enrichment and spread of invasive species can have had significant consequences for our freshwater species, many of which have declining or threatened populations. Stress from compromised habitat reduces immunity in animals and can cause fungal or parasitic diseases that wouldn't otherwise affect fish populations.

If your farm has a river or stream with tidal influence, it is a potential habitat for inanga /whitebait spawning (egg laying). Protecting and improving habitat in these areas is important to ensure that these fish can breed. If your farm includes such an area, the activity you are planning to undertake on your farm may have additional rules.

Wetlands

Much of the original wetland habitat in the Poutō FMU has been lost. However, there are still extensive wetlands in the dunes in the south-west of the FMU. These are regarded as the best and most pristine example of a dune system with wetlands in New Zealand, and they are among the most extensive. They contain freshwater wetland vegetation types within a sequence from coastal dunes to inland freshwater lakes. These wetlands support many threatened bird species, including the grey duck and Australasian bittern. They are the top ranked wetland in Northland.

View maps of the Top 150 wetlands in Northland.

Many wetlands remain on the margins of dune lakes. They act as important riparian buffers maintaining water quality. However, due to drainage for farming, cropping and horticulture, forestry and urban development, the extent is much reduced. Wetlands are particularly valuable on lake margins or in overland flow paths to filter out nutrients and sediment before they enter lakes. Many native plants and animals rely on or benefit from on the connection between lake and wetland habitats.

Your freshwater farm plan should identify any wetlands on your farm and set out actions to protect them and, if necessary, restore them. There are also likely to be opportunities to create wetlands in some cases to help reduce sediment, *E. coli*, or nutrient loss to freshwater.

Riparian vegetation loss

Vegetation on the margins of waterbodies is an important part of freshwater ecosystems. Most of our aquatic native species are adapted to bush clad waterbodies that provide shade, cooler water temperatures and good connections between freshwater and land that many species rely on for feeding and lifecycles. Healthy reed beds on lake margins are valuable for filtering catchment run off and are important habitats or breeding cover for native plants and animals.

The loss of this riparian vegetation can reduce habitat quality for native species and result in lower dissolved oxygen, warmer water and more frequent algal blooms. This is one of the reasons why about half of the rivers in Northland do not score well when we measure the variety and abundance of insect life in their ecosystems using the macroinvertebrate community index (MCI).

More detail on the state of our rivers

www.nrc.govt.nz/CCCVResources

The state of our rivers as measured by MCI (Macroinvertebrate Community Index – an indicator of the health of aquatic ecosystems)

www.nrc.govt.nz/CCCVResources

Pest plants and animals

One of the biggest threats to dune lakes and wetlands in Poutō is the introduction of pest fish and weeds. Pests can dramatically affect water quality and habitat value for native species and the recreational value of waterbodies. They can also affect infrastructure (e.g. block water intakes) and the ability of people to use water for irrigation or drinking.

The introduction of pest species to dune lakes is especially harmful as they tend to be high value habitats for native species and removing pests once introduced is typically very difficult. Aquatic pests are often accidentally introduced by recreational users transporting pest plant remnants or juvenile animals on vessels or gear that have not been properly cleaned.

On-farm pests, especially pest plants, can also be introduced by machinery transporting species from one site to another – for example, a digger doing works in or near a waterbody or drain where pests are present, then moving to another site without being cleaned or checked.

Climate change is expected to bring warmer temperatures, which is likely to favour the expansion of existing pests and could mean new species are likely to arrive and establish.

It is recommended good practice to clean machinery where possible before moving to another site – especially if it has been working in an area where pest species are known to be present.

Changing climate

Your freshwater farm plan should consider challenges due to climate change, such as drought, extreme weather events and increased water temperatures.

Poutō FMU is likely to experience more droughts in the future. Dry periods can lead to soils cracking. When rain does occur on cracked soils there is greater movement of nutrients into the water systems.

Increased severity of storms, including wind strength and intensity of rainfall, is likely to cause significant slips and erosion, damaging forests and farm infrastructure like fencing and roads. High rainfall in areas with weak bedrock and soils increases the risk of erosion, landslides, stock damage, and runoff of contaminants into freshwater.

Flood hazard zones are shown in the Te Taitokerau CCCV viewer.

www.nrc.govt.nz/CCCVResources

Take care with the timing and location of the application of farm dairy effluent to avoid nutrients and *E. coli* being washed into waterbodies during rain. Flooding can also transport sediment from exposed earth and cultivated areas if adequate sediment controls are not in place.

Climate change predictions also include rising water temperatures. Higher ocean temperatures causing sea level rise may increase salinity upstream, potentially moving coastal and estuarine habitats and requiring water in-takes to be relocated. Warmer water temperatures also increase the frequency of algal blooms in rivers and lakes, especially when flows are low and nutrient levels are high. These blooms can limit the ability to take and use water and affect recreational and cultural values for water. Many of our native freshwater species are adapted to cooler water and shaded waterbodies. Climate change is therefore likely to make current issues facing native species even worse, making it even more important to restore riparian cover, increase the area of wetlands to supplement flows in rivers, and use freshwater efficiently.

The Climate and Weather of Northland (NIWA)

www.nrc.govt.nz/CCCVResources

Ngā ture kāwanatanga ā-motu, ā-rohe hoki
Central government and regional council rules

There are both national and regional rules that are relevant to freshwater farm plans. National rules include:

- The Resource Management Act 1991 Part 9A Freshwater Farm Plans
- The Resource Management (Stock Exclusion) Regulations 2020
- Resource Management (National Environmental Standards for Freshwater) Regulations 2020

www.nrc.govt.nz/CCCVResources

The Ministry for the Environment provides additional information about freshwater farm plans.

Ministry for the Environment – Freshwater Farm Plans

www.nrc.govt.nz/CCCVResources

Regional rules are applied through the Regional Plan for Northland.

Northland Regional Plan

www.nrc.govt.nz/CCCVResources

There can be overlaps between national and regional rules – in these cases the most restrictive rule applies. For more guidance, please see the Northland Regional Council Farmers' Hub webpage.

www.nrc.govt.nz/CCCVResources

The sections of the Regional Plan most relevant to freshwater farm plans are listed below:

- C.2 Activities in the beds of lakes and rivers and in wetlands
- C.3 Damming and diverting water
- C.4 Land drainage and flood control
- C.5 Taking and use of water
- C.6 Discharges to land and water
- C.8 Land use and disturbance activities (including livestock exclusion, earthworks, cultivation and vegetation clearance). There are also catchment specific livestock exclusion rules that apply in the Mangere and Whangārei Harbour catchments – see Rules E.3.4.1 and E.3.5.1
- E.3.2 Provisions specific to Outstanding Freshwater Bodies (water takes from lakes, restrictions on new plantation forestry).

In some cases, rules apply to areas identified on Regional Plan maps. The Regional Plan maps most relevant to freshwater farm plans are:

Hill Country and Lowland Areas – these relate to livestock exclusion rules (the rules differ for Hill Country and Lowland areas depending on livestock type). Please note there are also catchment specific livestock exclusion rules that apply in areas mapped as Whangarei Swimming Sites Stock Exclusion Areas.

Erosion Prone Land – tighter controls on earthworks and cultivation are applied to these areas mapped in the regional plan.

Outstanding Freshwater Bodies – these maps identify lakes and rivers (and their catchments) that have very high ecological, cultural, recreational or landscape values and are therefore subject to specific rules.

Priority Drinking Water Abstraction Points - these identify drinking water takes where particular controls on farm wastewater discharges and livestock exclusion are applied upstream of the water take (under Rules C.6.3.1 and C.8.1.2).

Mapped Sites of Significance to Tangata Whenua – these maps show sites and areas of significance to tangata whenua in the Regional Plan that are in freshwater bodies or the coastal marine area. Note: The maps do not reflect all sites that are important to tangata whenua in the region as many are not mapped or included in the Regional Plan. It is recommended that the relevant hapu is contacted for information on such sites.

Regional Plan maps

www.nrc.govt.nz/CCCVResources

800 002 004
info@nrc.govt.nz
www.nrc.govt.nz

Northland
REGIONAL COUNCIL
Te Kaunihera ā rohe o Te Taitokerau