

What are peat lakes?

Peat lakes represent some of the oldest lakes in the Waikato, having formed between 18,000 and 22,000 years ago, and are mostly small to moderate in size (1-108 ha). They are valued for their unique ecological values, their scientific and educational interest, the recreational opportunities they offer as well as their cultural, spiritual and historic significance.

The high percentage of organic matter found in peat often causes water in the lakes to be the colour of tea. The water in these lakes is often mildly acidic, the bottom waters have low dissolved oxygen levels and the lakes and surrounding wetlands are naturally low in nutrients. They are regarded as internationally unique and important ecosystems, providing critical habitat for a number of specialised, and often rare and threatened, plant and animal species and communities.

Before European settlement, most of the peat lakes had no inlets or outlets. Water would have come from rainfall or as groundwater from the surrounding peat bogs, and was lost primarily through evaporation. Drainage of the surrounding peaty substrates for agricultural purposes has lowered water levels and lake outlets have been created or deepened. Reduced lake levels and the loss of wetlands around them to filter nutrients and sediments from surrounding land has resulted in many of the lakes becoming much smaller, shallower and nutrient enriched.

Places with historic and cultural significance...

A number of lakes have pā sites associated with them. These pā are usually found around the lake margin, either on a natural or a 'built' mound.

Some of these sites are recognised by archaeologists as being some of the best preserved prehistoric open air stone-age settlements in the world. Most of these lakes also have a special significance to local iwi who whakapapa these areas. The sites around the lakes have been relatively well preserved due to the peat being semi waterlogged which has aided in the preservation of wooden artefacts.



...to enjoy...

Game bird hunting is a popular traditional activity on most of the shallow lakes. Licensed hunters are permitted to take game during the annual hunting season – which for most species begins the first Saturday in May and runs through to the last Sunday in June. Most hunters elect to build and maintain hunting stands or mai mai and lure game to the stand using imitation calls and floating decoys.

Lake Ngāroto is a popular sailing, paddling, wind surfing, rowing and fishing venue with well-established public facilities including a circuit track for walkers and bikers. Several lakes, like Rotopiko East and Lake Cameron (Kaeroatahi) offer walking tracks and picnic areas and opportunities for exercise or bird watching.

...and to learn

Each lake has its own individual characteristics and offers a variety of opportunities for studying wetland ecology. The Lake Ruatuna Recreation Reserve (adjoining the lake's southern margin) provides a base for school or community groups to observe and learn about the lake and its wildlife. A discovery trail at Lake Rotopiko teaches visitors more about the lake and wetland, and its inhabitants and threats.



A home to unique plants and animals

Unique plants and animals have adapted to living in the conditions provided by peat lakes and adjoining wetlands. A diverse range of bird species either depend on or frequent wetlands and can be found on the open water or around the margins of the lakes.

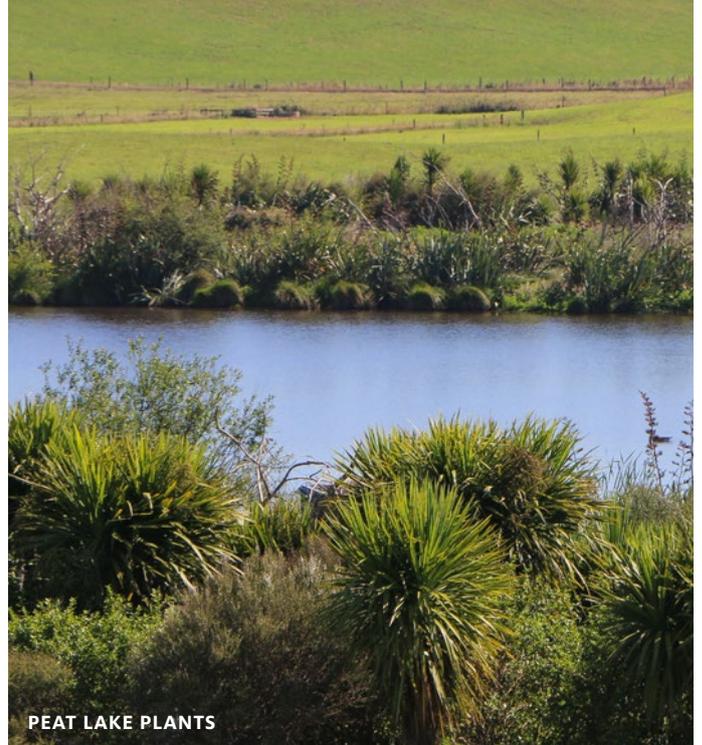
Birds

The Australasian bittern and the New Zealand dabchick are two resident species now classed as 'threatened' due to low numbers and disappearing habitat. Other species include waterfowl like grey duck, grey teal, New Zealand shoveler, little black and black shag. The margins provide habitat for species such as banded rail, marsh and spotless crane, white faced heron, pūkeko and North Island fernbird. Common introduced species include mallard duck, Canada goose and black swan.



Fish

Native fish found in the shallow lakes include lake dwelling smelt, short and long finned eels and common bullies. The nationally threatened black mudfish are also likely to live in the peat lakes in the Waipā district. Black mudfish have an interesting lifestyle and are able to burrow deep into wet mud or hide under submerged logs and remain dormant during dry periods with low water levels. This lifestyle gives them an advantage over other fish as they can exploit seasonally wet areas.



Plants

The margins of the peat lakes are home to a diverse range of plants adapted to living in wet and peaty conditions. Tall emergent sedges and rushes are found around the margins to 1.5 metres in depth. Behind these sedges are floating mats of grasses, tangle fern and mosses, with species such as mānuka, broad leaf shrubs and flaxes on the drier edges.

There are also some special types of aquatic plants found within some peat lakes, such as a native member of the group of water plants called bladderworts (*Utricularia* spp). These plants are carnivorous and suck their prey, such as mosquito larvae and waterfleas, into tiny bladder like traps before digesting them. Other rare species in peat lakes include a type of floating duckweed (*Wolffia australiana*) – the world's smallest vascular plant and native characean algae (underwater plants).

Invertebrates

Some interesting invertebrates (animals without backbones) found in peat lakes include whirligig beetles, named because of their circular swimming motion. An interesting feature of the adults is they take a bubble of oxygen under their wing when they dive below the surface hunting for prey. This oxygen reserve improves their hunting efficiency and lengthens the time they can spend under water. Other invertebrate species include a water mite, freshwater jellyfish and leeches, as well as a range of other beetles and insects.



Proud of Lake Mangahia improvements

When we purchased the farm in 2003 the lake was surrounded by grey and crack willows and scrub. Very little water was visible and stock would often become bogged in the swampy land around it.

We were aware of other peat lake restoration projects and wanted to be involved and do the right thing for Lake Mangahia. However, our first obstacle was the lack of a clear title to the land around the lake. For rating and legal purposes it was classified as abandoned land, and therefore no funding or assistance for restoration could be provided.

In an effort to trace the original title holders, we approached Graham Cullen from Lifestyle Research. He was invaluable in using Waikato surveys to trace us back to their descendants in the U.K. Using principles from old English law regarding common land, we were able to obtain clear title to the land around the lake and amalgamate it with the farm title.

“Pieter is a man on a mission. He’s not done until the job is done.” Joy

Once the title was obtained we arranged a QEII covenant. After that funding, assistance and advice followed from various organisations, including Waipa District Council, Waikato Regional Council, Honda Tree Care and Fonterra.

These organisations helped provided advice and helped with pest plant control. Willows were initially sprayed by helicopter and control followed up by groundwork over several years to remove unwanted and invasive species. They also donated a lot of the trees you see here today and helped us with planting.

It really was a community effort, with a lot of people chipping in. Including the Geddes family, our dairy farming neighbours, who made similar contributions and their adjoining lake frontage.

“The lake wouldn’t look like it does today without the help of many volunteers, including our friends, family members and neighbours, and even volunteers from overseas.” Pieter

We have erected fencing around the lake to enclose the planting and all stock access has been stopped. This has added the advantage of making farm management easier. Our farm races have been upgraded and we will install a sediment/settling pond to enhance water quality entering the lake.

We are confident that with sound and sustainable farming practices we will safeguard the lake and surrounds for future generations and provide a link with the past as well.

The visual appearance of the lake and surrounds is aesthetically very pleasing. These days, a large body of water is clearly visible, which is immensely satisfying. This is an ongoing rewarding experience and we are very proud of the lake.

“We strongly encourage other landowners to consider preserving these assets. There are no downsides.” Pieter and Joy





MURRAY DAVIES AND KEITH SMITH

Saving Lake Koromatua for future generations

Back in 1996 we read a NIWA report, which stated that if we didn't do anything there wouldn't be a lake left in 14 years' time. If we wouldn't act the lake would turn into a bog. As keen hunters who used the lake for our sport, we decided it was time for action and we've been involved in restoring the lake since 1997.

“When we started the restoration the lake literally smelled like cow waste, because of the effluent directly running into it.” Murray

As part of the rehabilitation Waipa District Council built the outlet weir and the inlet diversion to enable a greater volume of water to enter the lake. This allowed us to raise the lake level by half a metre. We installed a quarter 90 weir at the outlet and increased the period of flow recession in the Koromatua Stream. This means that we are able to maintain more water in the stream for longer, which helps with diluting discharge and prevents the stream from drying up too fast. Over the years following, we installed various sediment traps to help filter the water before it reaches the lake.

Weed control was next. When we started our work here, pest plants, like honeysuckle, blackberry and willows, were so high and thick you couldn't even see the lake. It took a lot of hard work and a lot of spraying to get to where we are now, and it's an ongoing battle.



SILT TRAP

To help us get around the lake and do the work, we installed a walk way. Once all the weeds were cleared, we could focus our efforts on planting native plants. We sourced native seeds and grew the seedlings ourselves with the help of friends and family. We planted mānuka and kānuka to create shelter for frost sensitive species such as tawa, titoki, mahoe, five finger and wineberry. In the future we're hoping to plant more 'level three plants' as we call them. Trees that will grow to the upper storey, like rimu and matai.

“I think we've grown and planted a total of nearly 36,000 native plants.” Keith

To give our new seedlings and other plants a good surviving chance, we ran a successful trap line to get rid of a lot of the animal pests. As a result we're seeing a lot more undergrowth. Most of the ferns you see today haven't been planted, they just established themselves once we got rid of the vegetation eating pests, like possums.

Most people who visit are blown away by what happened to the lake and the changes we're seeing today. We're hoping to install some picnic tables at a spot where you have great views over the lake so people can enjoy the fruits of our labour.

The current state of the lake today is pretty much the result of the hard work of a group of five people, and funding we received from various organisations, including the Department of Conservation, Auckland/Waikato Fish and Game, Waipa District Council and Waikato Regional Council. The two of us, for example, have put in thousands of hours each. It shows what you can achieve if you care.

“This is one of the most rewarding things I've done as a volunteer. I'm really proud of saving the lake for my generation and future ones.” Murray

Lake Rotopiko: protecting a place to learn

When I walk visitors through the towering kahikatea forest at the edge of East Lake at Rotopiko, it's not the swaying and creaking tree tops that grab their attention – it's the amazing root systems at their base. All buttressed and gnarly and twisted, some are so exposed you can literally see under the tree!

As stunning as these root systems are, they are a constant reminder to me that this was once a swamp forest on the edge of a peat lake. Some of the trees here are big enough to be over 300 years old. What changes they must have experienced in their lifetime. The biggest, no doubt, was the land drainage in the 1900's that sucked away the mud and water that once cocooned their roots. Like a shrinking sponge left out in the sun, the land shrivelled up, leaving exposed root bases high and dry, and the trees standing all tippy-toed.

Kahikatea could survive the drainage, but many of the species that would have nestled in the slushy soil under their canopy could not. Black mudfish have retreated to the drain. Sedges and herbs yellowed, withered and vanished. Swamp shrub seedlings failed to establish. Once dry, the site would have been an ideal place for cattle to shelter in. Their grazing and trampling took care of the remaining undergrowth, leaving a stand of trees over a dry empty forest floor.

“We’ve got one of the worst records in the world for wetland loss. Over 90 per cent gone in under 200 years!”

The drains that robbed this swamp forest of its water and fragmented Rotopiko into three lakes were put in long ago, but we haven't stopped losing wetlands yet. The good news is we can

restore or even reconstruct some types of wetlands, and relatively quickly, but first we need people to care enough to want to do that.

Most New Zealanders value our spectacular mountains, ancient forests and beaches, but wetlands are a forgotten ecosystem. They are hard to visit. Think about it – who are the people that speak up for wetlands? It's the people who spend time in them; local iwi, duck shooters, scientists. To retain and restore wetlands, we need more people to care about them. This is a place we want to bring people to. The National Wetland Trust wants to build a National Wetland Centre here, not just to showcase Rotopiko, but to introduce people to the huge diversity and special features of what our founder Gordon Stephenson calls “our shy places”.

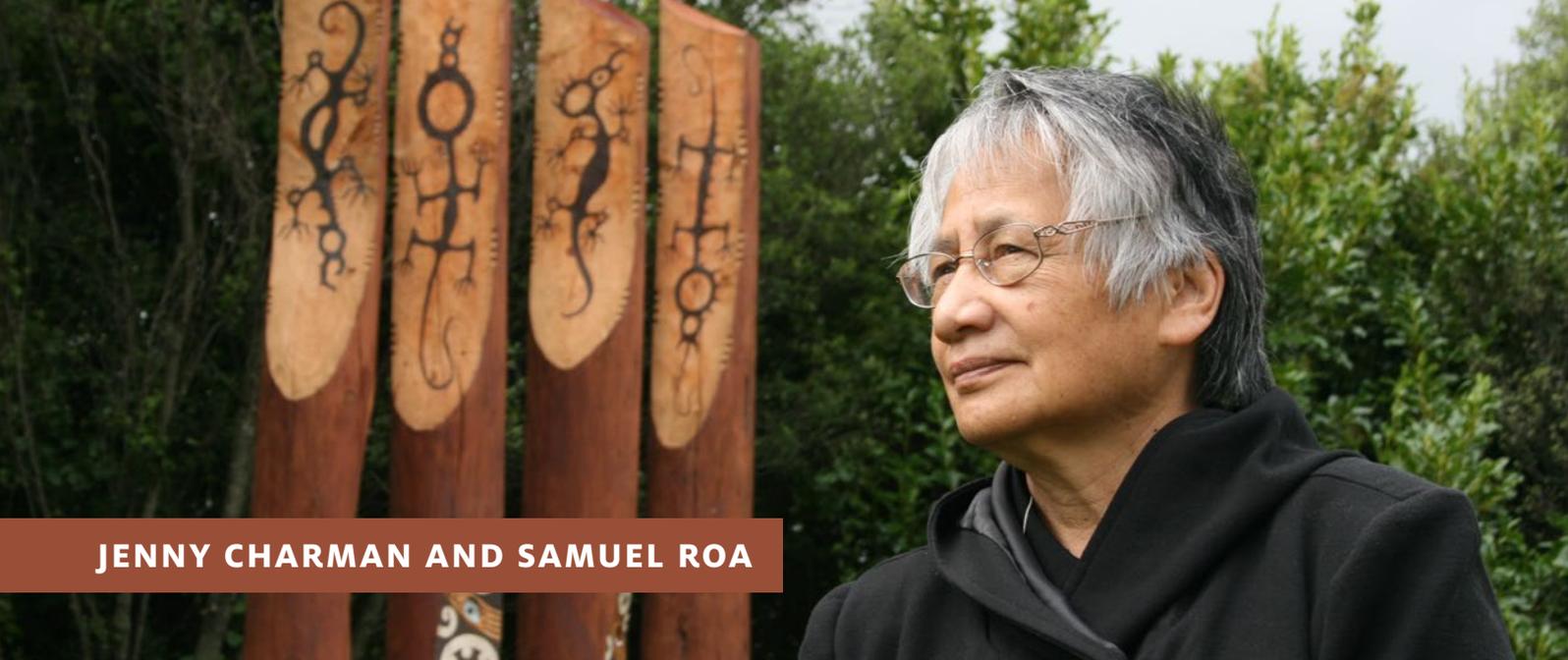
“We started by intensively restoring the site, to demonstrate the process and inspire others to do so.”

With the help of a wonderful group of volunteers, we've planted thousands of natives, controlled weeds, and set up monitoring to document the changes. The stock are now gone and native plants are re-establishing. We built a pest fence and got rid of the pests, so the fernbirds and spotless crane can breed in peace. We also dug out ponds in the old lake bed for the wildlife, and scraped off pasture grasses to restore the natural peat-forming plants.

Because getting people here is a crucial part of the project, we worked with Waipa District to put in parking, tracks, toilets, interpretation signs and seating. We also created a self-guided outdoor wetland discovery trail. Families can bring their kids here to play mudfish scrabble, eels and ladders and mix and match wetland birds – where else can you do that! A visitor centre building is still on the “to do” list, but we will get there.

The story of Rotopiko's restoration doesn't start with us. There's history I'm still trying to pin down. I meet locals who say “yes I remember planting totara there back in the eighties”. We know that Waipa District Council, the Department of Conservation and the NZ Landcare Trust were all working here before us, getting rid of willow and re-introducing rare peat-forming rushes. Sadly no-one thought to take photos before restoration began, but it sure looks great now. We can't wait to bring in the visitors and show them!





JENNY CHARMAN AND SAMUEL ROA

The cultural significance of Lake Ngāroto

Renowned ancestral carving Uenuku, which symbolises the guardian life force of the rainbow, was rediscovered in the swampy margins of Lake Ngāroto in 1906. The 2.7 metre carving is a revered and sacred relic of the Tainui people which may have fulfilled part of its function as a form of battle standard.

The carving was lost and buried during the time of the historically renowned battle of Hingakākā, at Ngāroto between 1780 and 1790. According to local traditional knowledge there was an invasion by a war troop made up of southern allied tribes and led by Ngāti Toa chief, Piikau-te-rangi. Piikau-te-rangi and his people had suffered earlier insult at being offered the last and smallest portion of the fish distribution.

Many thousands died in the battle of Hingakākā, which was eventually won by the Waikato collective of subtribes at the time. The battle was said to have been named after the red cloaks, made of kākā feathers, worn by the fallen chiefs.

Because of this associated history, the carving found in Lake Ngāroto is a taonga (treasure) of particular significance for Ngāti Apakura, Ngāti Maniapoto and the Waikato-Tainui people who attribute Uenuku's influence over rituals associated with both food and war and in his role as kaitiaki or guardian of Lake Ngāroto.

The striking Uenuku is unlike most carving styles of recent times and in fact is thought to be of a period predating many of the traditional carvings of the last two or three centuries. It is now displayed in the Te Awamutu Museum. However, it's been our dream to create some sort of acknowledgement of the rediscovery of Uenuku at Lake Ngāroto.

“The idea behind the pou is to build Uenuku a house to come home to.” Jenny

The pou have been installed in 2016, after a three year long project. We looked at the name “Te Paenga o Uenuku” the resting place of Uenuku because it traverses time, from its resting place in the past to possibly a home for Uenuku in the future.

The carvings we've put in place tell their own story. The four pou and spaces between them represent seven Atua; Tāne-mahuta, Tangaroa, Tāwhari-mātea, Tūmataunga, Haumia-tiketike and Ruamoko. Together with the lizards that are painted at the top of the pou, these embody the gods, spirits or kaitiaki that protect this lake. The lizards are deliberately reflected in a more old fashioned way, as a reference to a pre-human era.

As you look down the carvings, you will see the pou have large scallop shapes carved out, which are referred to as “Kape Rua”, with kōwhaiwhai patterns painted on them. These shapes and patterns symbolise parts of the lake and swamps that have dried out and acknowledges that Lake Ngāroto was once a lot bigger than what it is now. The lines carved across the Kōwhaiwhai patterns are called “Haehae”, and represent both the past and present pathways around the lake.

“We've placed the pou as close as possible to where Uenuku was found.” Sam

The creation of these pou has very much been a team effort. Multiple carvers, including Sam, all studied at Te Wānanga Aotearoa and have shaped them to the carvings they are today.

Throughout the duration of the project a large group of kaumātua have passed their historic knowledge down. Their help has been invaluable, and the people we would like to mention are Jack and Rangi Cunningham, Rangi Huriwaka, Ella and Solomon Nelson and Chris Tuapiki, and those who have sadly passed away; Te Ra Wright, June Ormsby, Ben and Richard Rangitawa, George and Charlie Maikuku, Sunna Thompson, Fred Porima, Haki Thompson and Sonny Anderson (Tohunga).

“We hope these Pou are the first of many historic and cultural reminders around this lake, and other lakes in the area.” Jenny

Celebrating the 15th anniversary of the Waipā District Peat Lake and Wetland Accord

During the late 1990s, management agencies and research organisations working together on issues relating to peat lakes and wetlands recognised that the formation of a collective agreement between them would help gain momentum towards protecting and enhancing these valuable resources.

The formation and signing of the Waipā Peat Lake and Wetland Accord in 2002 was a milestone in working towards achieving focused multi-agency conservation and management. It aimed to align the activities of management agencies and iwi in working toward the restoration and enhancement of peat lakes and wetlands in the Waipā district.

In 2017, 15 years after signing the accord, there is still a vision that these nationally significant heritage assets can be preserved and improved for future generations. The agencies will continue to align their peat lake and wetland management, and combine it with best land use practice by landowners and local conservation efforts.

The purpose and objectives of the accord are still as relevant today as they were in 2002. The signatories – Waikato Regional Council, Waipa District Council, the Department of Conservation, Auckland/Waikato Fish and Game Council and Nga Iwi Tōpū O Waipā – will continue to support these for the next 15 years and beyond.

The purpose and objectives of the accord

The purpose of the accord is to align the activities of the management agencies when working with landowners, tangata whenua and interested parties, towards the restoration and enhancement of lakes and wetlands in the Waipā district.

The objectives are to:

- promote the sustainable use and conservation of lake and wetland resources by developing and implementing relevant local management projects, regional and national policies and action plans, and international conventions
- encourage restoration of degraded lakes, wetlands and associated species that are in an unfavourable conservation status, through the application of sound environmental management and research
- maintain an overview of the status of lake and wetland resources by developing, promoting and coordinating assessment and monitoring programmes and disseminating the results
- develop a regional network of experts for the transfer of know-how, research and information through effective partnerships with like-minded organisations
- raise awareness of the functions and values of lakes and wetlands through education, information and awareness programmes.