WAIKATO PEAT LAKES

AREA:	LAKE	SUB-CATCHMENT
Areare	58 ha	268 ha
Ruatuna	28 ha	190 ha
Rotomānuka	45 ha	479 ha

Living Water is working in partnerships to restore these unique peat lake ecosystems, enhancing habitat around the lake margins and transforming agricultural drains into healthy waterways.

Map 1st Edition - FEBRUARY 2021

Living Water's focus is on three of the "acutely threatened" peat lakes in the Waikato region.

The lakes were once deep and surrounded by peat bog. Over time they were drained to create fertile land for pasture and crops, making the Waikato Region one of the most productive farming areas in New Zealand. Inlet drains were dug to drain the fields; outlet drains were dug to prevent the lakes flooding the farmland.

An unfortunate side effect is that remnant peat lakes are small and shallow, making them prone to extreme temperature changes and muddying of their waters by wind. They also receive runoff from surrounding farmland.

Ngāruawāhia · Lake Areare · Hamilton · Waikato River · Hamilton Airport · Ōhaupō · Cambridge · Lake Ruatuna · Lake Rotomānuka

LIVING WATER is a 10 year partnership between the Department of Conservation and Fonterra, focussed on finding game-changing and scalable solutions that will enable farming, freshwater and healthy ecosystems to thrive side by side.

We are working across five regions.

Wairua River, Northland · Pūkorokoro-Miranda, Hauraki · Lakes Ruatuna, Areare, & Rotomānuka, Waikato · AOTEAROA NEW ZEALAND · Ararira–LII River, Canterbury · Waituna Lagoon, Southland

LIVING WATER

Fonterra Dairy for life | Department of Conservation Te Papa Atawhai

www.livingwater.net.nz

LAKE RUATUNA

In May 2019 loggers were placed in the main waterways entering Lake Ruatuna to see how much water is entering the lake, where it's coming from and what contaminants are in it. This information helps plan the best course of action to reduce contaminants entering the lake.

Pinpointing Catchment Contaminant Loads

Progress: Discussions with landowners have led to proactive drain fencing and planting. The research has informed how to improve the sediment traps around the lake to benefit both lake and farmland.

Water Primrose (Ludwigia) Control

An introduced nuisance species that rapidly smothers other aquatic plants and clogs waterways, growth at Lake Ruatuna has been steadily increasing and at one point covered around 2.9ha of lake surface and surrounding waterways. This project aims to reduce growth by aerial spraying with a drone as it's much faster than traditional management by hand weeding or excavation.

Progress: 2.1 ha has been sprayed with almost full area reduction in growth. Aerial control has since been expanded to include willow, with very promising results.

Sediment Traps Trial

In 2016 Living Water installed sediment traps at Lakes Ruatuna and Rotomānuka to reduce the amount of sediment entering the lakes to improve water quality and improve habitat for aquatic life. More traps were installed at Lake Ruatuna in 2018.

Progress: Analysis of monitoring data from the sediment traps showed that their performance was highly variable. Steps have been taken to improve their function by planting native aquatic plants inside the traps to slow water flow, reduce water temperature, collect sediment around their roots and oxygenate the water, preventing algae blooms and stagnation.

Macrophyte Reintroduction Trial

We were hoping to translocate native aquatic macrophytes to Lake Ruatuna to reduce suspended nutrients and sediment, improve oxygen state and improve habitat for native freshwater species. Unfortunately, preliminary testing showed there was not enough light penetration for the macrophytes to grow due to peat staining in the water.

Ngāti Apakura – engagement and Pā Harakeke

A key focus of Living Water is working closely with local iwi to ensure Mātauranga Māori is woven into our projects. Ngāti Apakura works alongside us so their vision of kaitiakitanga is met with tangible actions: Always gathering iwi input into decision making and lake management, restoring water quality, reinstating rongoā plants and animals, and increasing/restoring cultural knowledge.

Progress: There has been significant progress on a Pā Harakeke/rongoā garden and nature education trail. Eleven varieties of harakeke have been planted.

Engaging with schools & the community

Living Water has been working with schools including Ōhaupō Primary School, Melville Intermediate and Te Awamutu College on restoration work around the lakes. Lessons have been around nature, restoration, endangered species, predator control, water sampling and Māori cultural values. The wider community has been involved in predator trapping, planting and Pūweto / Spotless Crake conservation.

Progress: Over 30,000 native plants put in by school visits. School fundraising helped fund the Ruatuna amenity block upgrade. Lake restoration inspired Ōhaupō township to adopt the peat lakes as their town identity by upgrading all their roadside signs and bus stops to feature Living Water imagery showcasing the peat lakes and local wetland birds.

Wildlife Habitat Restoration

Partnering with landowners, community and iwi to replace exotic weeds with native plants around lake edges, predator control by trapping, managing pest fish and retiring and restoring previously grazed public land.

Progress: Planting of over 200,000 plants over the three lake sites. Rongoā plant species have been planted in areas formerly occupied by privet and Japanese walnut. Pūweto / Spotless Crake are an indicator species, we are monitoring their numbers, an increase signals trapping and restoration is working. Pest fish barrier installed at Areare and and koi barrier soon to be installed at Ruatuna.

LAKE AREARE

Floating Wetlands

Floating wetlands are a plastic mat, covered in native aquatic plants – their roots spread into the water collecting nutrients as they grow. In 2015 Living Water installed a 60m2 floating wetland in a farm drain that flows into Lake Areare.

Progress: Monitoring has shown that nutrient uptake has been inconsistent - depending on the season and water levels. A key lesson learned for improving performance is greatly increasing the length of the wetland to 800m2 to allow more time for the water to be filtered and the plant's roots and tops need to be trimmed regularly or plants replaced at least yearly to prevent dead growth from going back into the waterway.

Use of eDNA to detect Pest Fish

We are using environmental DNA (eDNA) sampling at Lake Ruatuna to detect pest fish. The process uses a sample of water to identify what species are present based on scales, mucus and faeces shed. Pest fish like Catfish and Koi Carp are a threat to our native freshwater species. They degrade water quality by stirring up sediment, increasing nutrient levels and algae, and feed on aquatic plants. Traditional monitoring of pest fish requires intensive trapping or electric fishing to know what species and roughly how many.
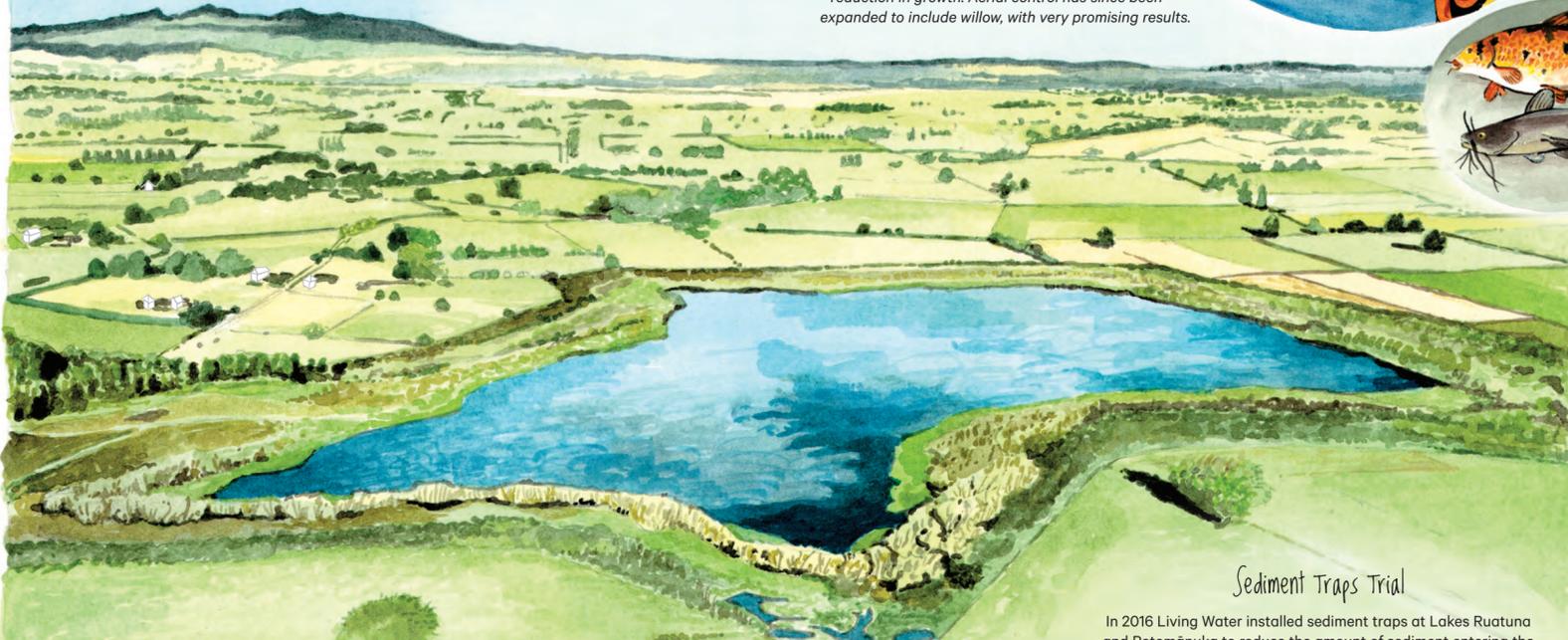
Progress: We have found there are no Koi present in the Lake and are installing a pest fish barrier to prevent adult Koi entering the Lake and this tool is being developed by DOC aquatic team for wider use.

Less than 1000 of the **Matuku / Australasian Bittern** are found globally and are rarely seen due to their secretive behaviour. They are found in wetlands and are a good indicator of the health of the wetland.

Pūweto / Spotless Crake are in decline due to loss of habitat from productive land use. These cryptic birds are a key indicator of how our restoration work and predator control is going as their population bounces back quickly. We're hoping long term monitoring will show an increase in numbers.

LAKE ROTOMĀNUKA

Ōhaupō · State Highway 3

Raupō is a wetland plant growing up to 4m tall providing valuable habitat for wildlife like native fish and rare wetland birds like the Matuku / Bittern and Pūweto / Spotless Crake while also helping to filter nutrients out of water.

Hydroseeding Trial

Hydroseeding involves spraying a compost slurry mixed with seeds on to bare ground. We tested this to see if it is an economic option for planting stream banks, using Carex seeds, which helps capture sediment and effluent runoff.

Progress: We were able to successfully germinate Carex secta at ~1 plant per m2. A further trial over summer 2019-20 failed due to extended drought conditions.