



Lakes380

Our lakes' health  
past, present, future

Me hoki whakamuri,  
kia haere whakamua



## CASE STUDY

Enhancing lake management through learning from the past

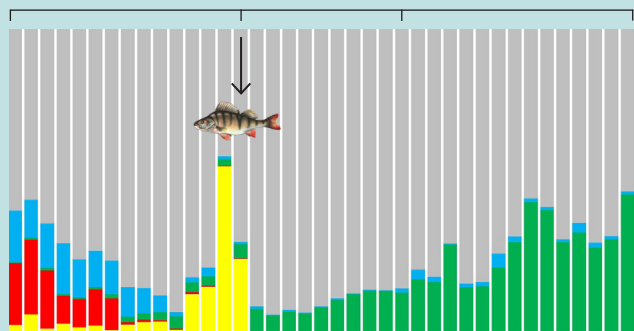
# LAKE POUNUI

The catchment of Lake Pounui (Wairarapa) is 95% native forest. However recent monitoring shows the lake has severe cyanobacterial blooms and poor water quality. In the absence of land-use change, what has caused the decline in lake health?

Answers to this question can be found by taking sediment cores from the bottom of the lake. Laid down year upon year, sediments preserve indicators of lake life and water quality, equivalent to centuries of monitoring. Using a combination of microscopic, chemical and DNA-based methods we can determine how and why lake communities and water quality has changed. This information can be used to inform restoration and develop management strategies.

Analysis of the sediment core from Lake Pounui suggests that the introduction of non-native fish in the late 1870's caused a dramatic shift in the food web which ultimately caused the cyanobacterial blooms. Many of the species living in the lake prior to this introduction are still present, but only in low abundance. If non-native fish could be removed and steps taken to the reduce nutrients, lake health would improve.

2016                      1870                      1260 (Māori arrival)                      500



## ENVIRONMENTAL DNA

The colours bars represent different types of bacteria. There are two key findings:

1. Bloom forming cyanobacteria (red bars) were not present before European arrival
2. Introduced fish (perch and trout) caused a dramatic change in the types of bacteria in the lake

■ Bloom-forming cyanobacteria  
■ Bacteria associated with degraded water

■ Bacteria associated with non-native fish  
■ An example of a bacteria that die out as water quality degrades