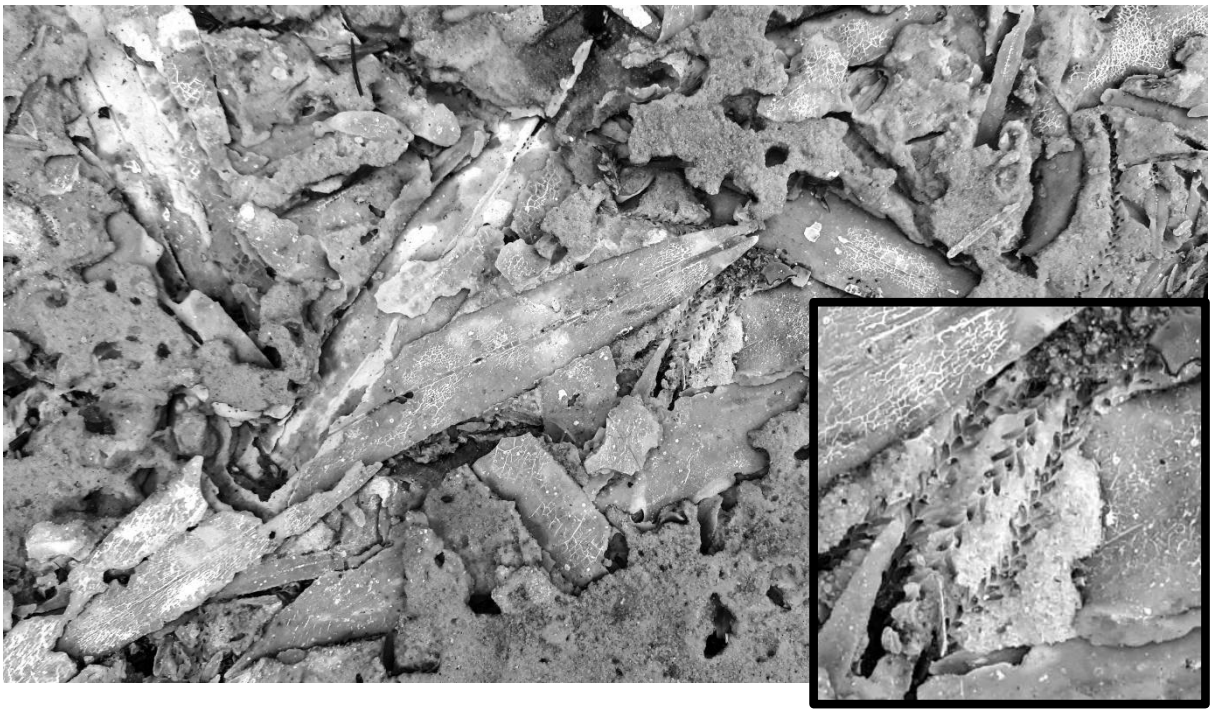
## Puarenga Stream, Rotorua

Jacqui Bond

My commute along the Puarenga Stream cycleway does not fill one in awe for our native flora. The huge eucalypt trees are impressively tall, and the acacias and cherries do have an impressive display of reproductive organs at certain times of the year, but they are not native to this landscape and so have limited ecological value.

In honour of Conservation Week the nearby Forest Research Institute SCION decided to do a Puarenga Stream clean-up and invited the Department of Conservation to join in. So a bunch of us eco-warriors shuffled down the stream peering between exotics to find discarded plastic. I pushed through a patch of blackberry to stumble upon a fresh slip which lead down to the steaming stream edge.

Not all parts of the Puarenga Stream, that flows between Whakarewarewa and Lake Rotorua, are geothermal but this part was, you could hear fizzing bubbles, and see sinter terraces, some being freshly exposed by the slip. There were large and small tree stumps poking out of the mud, a very unlikely place for a present-day tree to grow. On a sinter terrace there were what appeared to be the fossilised remains of leaves.



Some of these leaf prints had the fine imprints of rimu, a tree not common around the Puarenga these days. And what is that other long tawa-like leaf?

Large tree stumps were embedded in the mud with sprawling roots expanding out into the river as though they had been abandoned by their stem and upper branches (E1886116, N5772045). A very unlikely place for a modern-day tree to grow. What species were they? Native or exotic, ancient or recently dead?

Examining the structure of wood cells under a microscope can, to the expert eye, identify the species of wood; we have just the expert in our neck of the woods, Lloyd Donaldson at SCION. Peering down the microscope, he concluded they were softwoods (gymnosperms), which had annual rings (not all trees do) and they had cells filled with red resin which is a fingerprint distinct to rimu and totara. With totara being the most durable of the two species that would be the assumption for these stumps; however, smooth black bark could still be seen on the roots indicating rimu. Maybe the geothermal conditions have preserved the remains, or they have been recently exposed through erosion.

What about the age of these trees? The largest stump is approximately 900 mm in diameter and has rings approximately 1 mm in thickness which would make the trees, when they died, around 400-ish years old.

Through these large old stumps another time can be imagined: a podocarp and broadleaf forest near a river, a new geothermal site appears, trees grow slowly then die, the river changes course and a forest is buried but remains are preserved in the mud.

Maybe we could also imagine a time in the future when the Puarenga Stream could slowly move toward what it once was, a meandering geothermal river weaving through native forest.