

PAKURATAHI 2024 ANNUAL REPORT

MESSAGE FROM THE PROJECT LEADER

James Powrie

In 2024, the Pakuratahi Land Use Study took a significant step forward with the installation of monitoring equipment. Led by Dr. Ashton Eaves (HBRC) and Matt Brown (Hydrologic), new infrastructure was set up to track water quality in two key areas: a pine forest catchment and a farmed catchment in Tamingimingi.

We also conducted fish surveys using electric fishing and eDNA sampling to follow up on last year's sampling, helping us better understand the aquatic life in these waterways.

A 15-year project plan was finalized, compiling baseline study data into a comprehensive "story map" to guide future research. We also improved our data management system and explored licensing options to ensure effective data sharing.

Throughout the year, key stakeholders, including experts from Scion, Ministry for Primary Industries (MPI), and Pan Pac, visited the site to assess progress. Continued funding from the Forest Growers Levy Trust ensures we can expand project design and spatial analysis in 2025. Additional studies, supported by Ministry for the Environment (MfE) and MPI, will explore similar monitoring approaches in related catchments.

DEVELOPING THE 15-YEAR PLAN

James Powrie & Tim Payn

With input from the Steering Committee, we created a 15-year plan to monitor environmental impacts before, during, and after harvesting cycles. The goal is to improve forestry practices in an era of increasing climate risks. This plan includes:

- Data collection and catchment monitoring
- Analysis and data management
- Education and knowledge sharing
- Clear governance and communication strategies

A rolling three-year operational plan will be updated annually to remain flexible and responsive to new research opportunities. Background to the study can be found in this story map <https://arcg.is/1iPuvq0>

WATER AND SOIL MONITORING

Ashton Eaves, Dan Fake & Kurt Barichiev

Two water quality monitoring stations are being installed in the Pakuratahi and Tamingimingi streams, with periodic sampling beginning in early 2025. Soil quality monitoring is also underway, with sample plots established in different land covers, including a juvenile forest block and a mature forest area. These assessments will contribute to the regional Soil Quality Monitoring (SQM) program, which tracks soil health across various land uses, from orchards to pasture and forests.



Tamingimingi ISCO site and new rock ramp fishway installed in collaboration with HBRC, NIWA, Pan Pac and Australian Fish Passage Services

FISH AND STREAM MONITORING

Dan Fake

In January, electric fishing surveys were conducted in three streams: Pakuratahi (pine forest), Tamingimangi (pasture), and Fishers (native forest). The surveys found abundant koaro (a whitebait species) in the Pakuratahi stream, indicating high water quality. Other species observed included longfin and shortfin eels, redfin bully, and smelt.

The Tamingimangi pasture stream had a similar mix of species, while the native forest stream had fewer fish, possibly due to limited habitat availability. These results help us understand how different land uses affect freshwater ecosystems, especially after forestry harvests.



Pakuratahi ISCO site

DATA AND MAPPING UPDATES

Priscilla Corbett-Lad & David Palmer

Data Management System

A new data management system, hosted by Scion, was developed to organize and securely store environmental data. This system integrates cloud-based platforms for real-time data analysis and will make findings accessible via public platforms.

Erosion and Landscape Analysis

Using LiDAR technology, we mapped erosion patterns in the landscape before and after Cyclone Gabrielle. This allows us to track shallow landslide events and better understand sediment movement. Additionally, we developed a Canopy Height Model to estimate tree ages and locations, ensuring more precise tracking of forest growth over time.

NEW SOIL MONITORING PROGRAM

Andy Hicks

A new study, supported by MfE and MPI, will expand soil monitoring efforts across seven different land cover types, including native forest, pasture, and pine plantations. This research aims to refine how we measure long-term environmental effects of land use, with a focus on LiDAR and satellite data.

FUTURE RESEARCH OPPORTUNITIES

Chandra Ghimire

The Pakuratahi project offers unique opportunities for further research. One potential study could investigate how soil disturbance from forestry operations affects long-term recovery. Key research questions include:

- How does soil quality change over time after a disturbance?
- How do soil characteristics influence erosion and water flow?
- What factors are important for the recovery of soil characteristics in harvested forests?

We welcome ideas for additional research and encourage collaboration with experts in forestry, soil science, and environmental monitoring.

COMMUNICATION AND OUTREACH

Effective communication is essential to the success of the Pakuratahi Land Use Study. Our team is working with communication specialists from Scion, HBRC, NZFOA, and Pan Pac to share findings with the public and industry stakeholders.

Throughout 2024, we presented our research at various conferences and met with key groups, including local Iwi and government officials. In 2025, we plan to increase outreach efforts through field days, a dedicated web portal, and expanded stakeholder engagement.

GOALS FOR 2025

- First full year of stream monitoring data
- Establishment of sediment monitoring and particle size distributions in the estuary
- Launch of a public web portal for project data
- Detailed geology and soil studies
- Increased outreach through field events and presentations
- Understanding upcoming harvest plans and their potential impacts

This project represents a major step forward in sustainable forestry and environmental monitoring. We look forward to another year of progress and collaboration in 2025.

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Pakuratahi Storymap

