



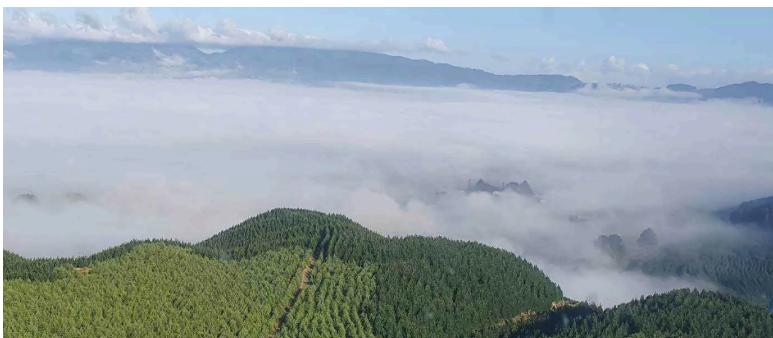
BIODIVERSITY RESEARCH

RESEARCH ON KAINGAROA FOREST SOIL MICROBIAL COMMUNITIES BY AUCKLAND UNIVERSITY OF TECHNOLOGY IS UNDERWAY

The Kaingaroa Forest study being undertaken by Auckland University of Technology (AUT) on soil microbial communities seeks to understand the impact of forestry management practices on microbial composition, structure, and function.

Soil microbial communities are crucial for soil health, driving functions such as organic matter decomposition and nutrient cycles, and are influenced by environmental factors, making them suitable for monitoring soil health.

Timberlands is funding the AUT research, and the team aims to reveal how forestry management practices affect below-ground microbial communities in Kaingaroa Forest, which is growing its third generation of [predominantly] *Pinus radiata* trees.



WHAT WILL THE STUDY LOOK AT?

There are four research questions focusing on microbial composition and functions, the impact of copper fungicides, and the potential of microbial communities as bioindicators.

To understand the microbial community's impact on adjacent ecosystems, six transects will be sampled at various distances from forest edges bordering pasture and indigenous forests.

The study will also analyse microbial communities in *Pinus radiata* stands of different ages to understand how microbial function and diversity change over time.

And lastly, the research will include the impact of copper fungicides on microbial communities by sampling stands with different histories of copper application. The potential of microbial communities to serve as bioindicators of copper fungicide impact will be assessed using microcosms treated with varying copper concentrations.



Te Wiki o Te Taiao



Timberlands Environment Week 2024 | Page 2

AUCKLAND UNIVERSITY RESEARCH TO STUDY BIRDLIFE INSIDE KAINGAROA FOREST ESTATE

Timberlands is backing Auckland University research to explore how avian communities, particularly raptors and robins, thrive in Central North Island's (CNI) *Pinus radiata* plantations. This body of work will use these bird species as indicators of ecosystem health and will help the forestry industry understand the complex relationships between land management practices and wildlife.

Raptors like the falcon, morepork and harrier, alongside smaller birds such as the Aotearoa New Zealand robin and tomtit, will be closely observed as they are sensitive indicators of environmental well-being. The research will look at how these birds interact within the ecosystem, focusing on population dynamics, breeding habits, and the impact of forest management practices like harvesting and pest control.

Over the first year, a team of research students will establish monitoring systems to track bird populations across different forest areas. Techniques will include transect surveys, nest monitoring, and radio-tagging to understand how these birds forage, disperse, and survive in the plantation environment.

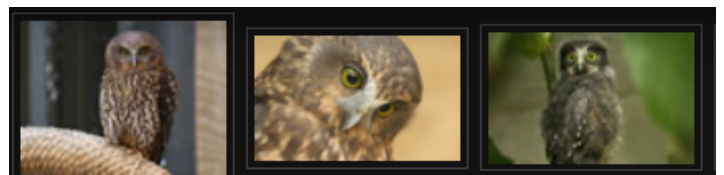
Smaller birds such as the Aotearoa New Zealand robin and tomtit, will also be closely observed as they are sensitive indicators of environmental well-being.



Sourced: Wingspan Instagram page - Photo by Jan Sutherland

The study will also explore the accumulation of pesticides, such as rodenticides, within the food chain, comparing findings from pine plantations to nearby native forests.

It is hoped that the research will provide valuable insights and data into which bird species are thriving in pine plantations, how successful their breeding is, and what forest management practices can improve biodiversity. Understanding the differences between plantation and native forest ecosystems will also guide the development of better conservation strategies for the forestry sector, helping to enhance ecological practices inside the Kaingaroa Forest Estate.



Sourced: https://www.wingspan.co.nz/birds_of_prey_gallery_morepork.html

Te Wiki o Te Taiao



Timberlands Environment Week 2024 | Page 3

CANTERBURY UNIVERSITY | EXPLORING THE COMPLEX RELATIONSHIPS BETWEEN PREDATORS, PLANTATIONS, AND NATIVE BIRD POPULATIONS

Introduced predators like rats, possums, and stoats have wreaked havoc on Aotearoa New Zealand's native bird populations. However, some plantation forests—particularly those dominated by *Pinus radiata*—seem to support thriving native bird communities.

This raises an intriguing question: could mammalian predator populations in these plantations be lower than previously thought?

Research being undertaken by Canterbury University, partially funded by Timberlands aims to find out.

The study will focus on understanding the population dynamics of introduced predators in large, continuous plantation forests in the Central North Island, including the Kaingaroa Forest Estate. The forests represent about 25% of Aotearoa New Zealand's remaining forest cover and playing a crucial role in supporting biodiversity.

Why It Matters

The ultimate goal of this research is to explore how plantation forests might contribute to Aotearoa New Zealand's Predator Free 2050 goal. To achieve this, researchers will assess whether predator populations in plantation forests differ from those in native forests, particularly in terms of abundance and seasonal reproduction. Understanding these dynamics could provide valuable insights for better pest control in plantation settings.



What's Next?

This research is a crucial first step in better understanding the predator dynamics within plantation forests and their potential role in supporting native wildlife.



If successful, this work could not only inform predator management strategies in plantations but also contribute to the nationwide Predator Free 2050 initiative, helping protect Aotearoa New Zealand's unique biodiversity for future generations.

WHAT WILL BE DONE OVER THE NEXT YEAR

The team will monitor predator populations every three months, focusing on rodents, possums, and mustelids (stoats, ferrets, and weasels). The monitoring will take place in Kinleith and Kaingaroa forests using tracking tunnels and chew cards. The study will consider factors like forest size, stand age, tree species (Douglas fir and *Pinus radiata*), and distance from native forest.

If the results are promising, the team may also introduce limited kill traps to study predator diets and reproduction, providing even deeper insights into how predators function within plantation ecosystems.

PEST PLANT

Darwin's Barberry

Why is it a pest?

- Darwin's barberry can invade a wide range of landscapes, forming thick colonies which outcompete and shade out native species.
- After grazing, re-sprouting occurs from all parts of the plant.
- It is considered a threat to forestry, agriculture and native plant ecosystems.

Where is it found?

- The only known sites of Darwin's barberry in the Bay of Plenty are in the Whakarewarewa forest and further south near Rainbow Mountain.
- It is found in disturbed forest, bush margins, pasture, tussock, and wasteland - areas with low to moderate soil fertility.

What does it look like?

- Darwin's barberry is a spiky shrub, 1-3m tall. Its leaves are dark green
- (smaller than holly), shiny and have five sharp spikes.
- Stems are tough, woody, and hairy.
- It has drooping clusters of deep orange flowers (5-7mm in diameter) from July through to February.
- Flowers develop into hanging clusters of oval purple-black berries with a white waxy coating. Seeds establish November to February.

Not to be
confused with:



Common hedge Barberry
Berberis glaucocarpa



Gorse
Ulex europaeus

Please do not control Darwin's barberry yourself. Contact Council and a biosecurity officer will be in touch to get further information and arrange a site visit.

Contact Centre 6am – 6pm: 0800 884 880

