

**Fully funded PhD position in New Zealand: using genomics to inform climate smart resilience breeding for aquaculture.**

**Ideal candidate: student with an animal breeding background and bioinformatics skills. Student will be enrolled for the PHD at the University of Auckland but based in Nelson at Plant and Food Research.**

**Project description**

Climate change is increasingly impacting food production systems and industry needs to better prepare for future climate challenges. New Zealand's ocean ecosystems and farmed finfish are already impacted by changing sea temperatures. To enable the finfish aquaculture sector to thrive and adapt to this uncertainty, this project will help to identify genetically resilient fish. This information will be used to create future adaptive breeding strategies that shift from a short-term productivity focus to incorporate resilience breeding in a new dynamic future context. Plant and Food Research is known worldwide for its innovative breeding and genomics research.



**Figure 1: The Australasian snapper (Sparidae)**

Using multiple molecular tools (e.g., DNA sequencing and gene expression analysis) the Ph.D. candidate will identify genes of importance for resilience and will deliver accelerated and increased genetic gain. This will be done by:

1. Growing elite snapper at four different temperatures and recording their performance in terms of growth and health.

2. Understanding how these performance differences are linked to genomic regions through whole genome and RNA expression analyses.
3. Using this information to identify candidate breeding regions to select for to produce a more resilient breeding line.

This research meets an urgent need by accurately identifying resilient finfish that will be bred to improve survival, welfare and performance in multiple environments, protecting and adding value to a growing industry into the future. This research will help to make sure the right species and genotypes are farmed in the right locations as climate futures emerge

This PhD project will provide an excellent opportunity to learn the latest interdisciplinary technologies and apply them to better understand how they can be used to inform breeding programmes. The PhD student will gain experience working in academic, government and private sector institutions. They will be a member of a highly active and collaborative group of researchers, and help develop new technological approaches and applied-genomic tools.

### **The candidate and how to apply**

#### **Idea start date is late 2024 or early 2025**

The successful candidate will be a highly motivated researcher with a strong background in animal breeding and genomic analyses and, ideally, finfish experimentation techniques. Trait phenotyping and data analyses to estimate breeding values, variance-co-variance matrices, GXE and trait heritability's, will be the main workload of the project. Therefore, knowledge and experience of a scripting language (Python/Perl) is needed. A proven ability and motivation to write research papers or reports is essential.

Students will be enrolled at the University of Auckland but be based in Nelson (<http://www.nelsonnz.com>). We will provide a three-year scholarship that provides a stipend and university fees.

Applicants should send a CV, contact details of two academic referees and a cover letter that states why you are interested in the position and how your qualifications and experience make you a good fit for the proposed research. Send these to Maren Wellenreuther ([Maren.Wellenreuther@plantandfood.co.nz](mailto:Maren.Wellenreuther@plantandfood.co.nz)). Applications will be considered until the position is filled. International applicants with a strong academic record are encouraged to apply.

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## **Funding Notes**

As part of the MBIE Endeavour programme "Fast-tracking Finfish Climate Change Adaptation", we are seeking a highly motivated PhD student to investigate the genomic basis for temperature resilience to establish more

resilient fish breeding lines. This is a fully funded PhD position based at Plant and Food Research ([View Website](#)) in Nelson (New Zealand) for three years to be filled in 2024.