

Interactive effects of non-native fish and environmental conditions on galaxiid demography

We have an opening for a student to undertake doctoral research investigating controls on the demography of non-migratory galaxiid fishes. The PhD position is part of the '[predicting future freshwater fish outcomes](#)' theme of [Fish Futures](#), a research programme driving change towards holistic and just freshwater fish management in Aotearoa. The student will be based at [Te Whare Wānanga o Waitaha | University of Canterbury](#) (UC), working primarily with Prof Angus McIntosh, assisted by Dr Jonathan Tonkin and Dr Robin Holmes, but will benefit from being part of the wider multi-disciplinary Fish Futures collaborative [team and partners](#) and UC's [Freshwater Ecology Research Group](#) (FERG).

Project background

Non-migratory galaxiids (ie those not having a diadromous life cycle; NMG; and pictured above) are a valued part of New Zealand's native freshwater fish fauna, but are threatened by habitat loss and negative interactions with non-native trout, compounded by climate change. The overall goal of this part of Fish Futures is to predict how trout and galaxiids interact under a range river conditions, including those due to climate warming. Interaction outcomes will largely depend on a balance between how NMG are affected by river conditions on the one hand and the effects of trout predation, also driven by river conditions, on the other. Given all the possible contingencies, studying how NMG demographics, including recruitment, survivorship, size structure and individual growth, are affected is a great way to understand the fundamental dynamics.

Research aim and approaches

The aim of the doctoral research is to investigate the drivers of NMG demographic characteristics in New Zealand rivers. The student will evaluate recruitment, survivorship, size structure and individual growth in multiple NMG types using a range of approaches to reveal the interactive effects of trout and river conditions. There is flexibility for the candidate to develop the specific programme of research, but it will be hands-on with lots of field work combined with statistical analyses, and likely to involve some combination of:

- (a) use of our extensive quantitative historical database;
- (b) repeated field sampling of galaxiid populations over wide environmental gradients;
- (d) use of mark-recapture techniques to measure fish vital rates; and
- (c) experimental manipulations in stream channels or mesocosms, including at UC's Cass field station or another site.



Further Information

PhD study at the University of Canterbury
www.canterbury.ac.nz/postgrad/

School of Biological Sciences
www.canterbury.ac.nz/science/schools/biological-sciences/

Freshwater Ecology Research Group
www.ferg.org.nz

Fish Futures
www.fishfutures.co.nz

Fish Futures

Reimagining freshwater ecosystem management in Aotearoa

Who you are

The successful applicant will have the potential to carry out insightful research, as well as the initiative and personality to communicate the results to a wide variety of groups, including other scientists, stakeholders, the general public and iwi (Māori tribal) partners. You must be able to work within a team, and can expect high quality mentoring and support. Experience in practical field ecology and ecological data analysis using R are essential, and freshwater ecology knowledge would be an advantage. Knowledge of te ao Māori, or a willingness to learn, is also particularly valuable. These characteristics will be demonstrated by your previous research experience, training, interests and other activities, and underpinned by either a Bachelors degree with honours or a Masters degree, in ecology or a related field, that contains a significant research component (demonstrated by associated outputs like a publication or thesis). We particularly welcome applications from individuals from under-represented groups.

Once selected, the preferred candidate would then need to apply to study at

The University of Canterbury and meet the [institutional criteria](#) for entry prior to the scholarship being confirmed ([check whether you meet these requirements](#)).

You should be able to start the position soon, and by early 2023. For international applicants, entry restrictions to New Zealand due to COVID-19 have now been lifted, but you would need to apply for and receive the appropriate student visa.

Who you will work with

[Angus McIntosh](#) will be your main mentor, but you will also work closely with [Jonathan Tonkin](#) from UC, [Robin Holmes](#) from the Cawthron Institute as well as others in the [Fish Futures team](#), including students and postdocs. You will primarily work within the Freshwater Ecology Research Group in Te Kura Pūtaiao Koiora | School of Biological Sciences at UC, with the [Tonkin Lab](#) and Fish Futures team also providing support. These groups are diverse and interdisciplinary in thought and approach, but focused on solving environmental problems. They all strive to cultivate an open, safe and supportive environment that values creativity,

diversity, integrity and collaboration, and recognises Te Tiriti o Waitangi (the Treaty of Waitangi).

Funding and start date

The 3-year PhD Scholarship provides an annual stipend of NZ\$28,000 a year tax-free, will cover full university fees, and the project has additional funding towards research expenses.

How you apply

To apply, please provide:

1. a Cover Letter that outlines your motivation, interests and experience, and contains a brief (one paragraph) idea for how different approaches could be combined to address the research aim;
2. a Curriculum Vitae; and
3. contact information for three referees able to comment on your academic and other achievements.

Applications should be emailed as **a single pdf file** with your name in the file name to angus.mcintosh@canterbury.ac.nz by **4 September 2022** with "PhD in galaxiid demography" in the subject line.