

SUMMER RESEARCH 2024/25

PROJECT ABSTRACT



THE UNIVERSITY OF
WAIKATO
Te Whare Wānanga o Waikato

PROJECT # 59

SUPERVISOR/S:	Dr Frank Burdon
PROJECT TITLE:	Understanding cross-boundary effects of biodiversity on ecosystem functioning
FIELD:	Ecology/Stream Ecology
DIVISION/SCHOOL:	HECS - Te Aka Mātuatua School of Science
PROJECT LOCATION:	Hamilton

PROJECT ABSTRACT:

Biodiversity is in decline globally. The consequences of reduced diversity for ecological functions and stability are well recognized, but how biodiversity influences functioning across ecosystem boundaries remains unclear. Streams and riparian zones are intimately linked by inputs of terrestrial organic matter and the export of aquatic insect prey, making them excellent coupled 'meta-ecosystems' to study the spill-over effects of biodiversity on ecosystem processes in adjacent systems. Invertebrates in forested streams rely strongly on terrestrial leaf litter as a source of energy, and emerging aquatic insects form an important diet component for a range of riparian consumers including birds, bats and spiders.

We are looking for an undergraduate student with interests in ecology and aquatic-terrestrial linkages. You will help contribute to our Marsden-funded project investigating the consequences of biodiversity on ecosystem processes across the stream-riparian interface. Our project aims to investigate cross-boundary effects of biodiversity on ecosystem functioning between coupled stream and riparian ecosystems. We will include cutting edge techniques in measuring biodiversity and describing food webs using molecular DNA tools and fatty acid biomarkers. Our study will help us better understand the importance of biodiversity in a spatially explicit context. Tackling this frontier in ecology will improve our ability to conserve, restore, and manage biodiversity and ecosystems from local to landscape scales.

The successful candidate will be involved in preparing emergence traps and decomposition assays for the project, carrying out pilot studies to assess the best leaf litter combinations for field experiments testing biodiversity-ecosystem functioning relationships, and helping with site selection and sampling of streams. You will be working towards a university degree in ecology or environmental science, with interests in stream and/or community ecology. You will be interested in joining an interdisciplinary research environment using field, laboratory, and modelling approaches in ecology. A reasonable level of physical fitness is required since there will be field work. Experience with stream invertebrate identification and familiarity with data analysis using R will be looked upon favourably but are not essential. You will have good communication skills in English and be a team player who has a positive outlook on life.

STUDENT SKILLS:

- Interest in ecology and evolution (e.g., studied BIOEB201, BIOEB202, BIOEB304)
- Valid NZ driver's licence
- Reasonable degree of fitness
- Field work experience
- Macroinvertebrate identification skills
- Experience using R statistical software

PROJECT TASKS:

1. Preparation of functional indicators and emergence traps for deployment to the field
2. Field sampling and data collection in stream ecosystems
3. Laboratory processing of functional indicators (e.g., leaf bags, cotton strips)
4. Laboratory identification of macroinvertebrate samples
5. Conduct data analysis using R scripts provided
6. Creation of a final research poster

EXPECTED OUTCOMES:

- Student's Research Poster (as per clause 6 of the [Scholarship regulations](#))
- Contribution to team project involving multiple researchers
- The student gets valuable research experience in stream ecology
- Ecological data to help advance key questions in stream ecology
- Co-authorship on manuscript due to contributions to project