



## **EcoNet 2025 Molecular analysis of trophic interactions workshop**

1<sup>st</sup> – 5<sup>th</sup> September 2025

### **Overview**

The construction of ecological networks using molecular data has become increasingly commonplace over the last decade. Molecular dietary analysis has generated interaction data for ecologically cryptic taxa and interactions that are otherwise difficult, if not impossible, to observe. The taxonomic resolution of molecular methods also unlocks the potential for inclusion and delineation of the interactions of morphologically cryptic taxa in networks. Methods like DNA metabarcoding are therefore an increasingly important component of the network ecologist's toolbox.

In this workshop, we will go through the process of analysing the gut contents of invertebrate predators using dietary DNA metabarcoding. From considerations for field sampling through DNA extraction and PCR, to DNA library preparation and nanopore sequencing, this workshop will cover the full process and will generate real sequencing data for downstream analysis by any participants of the workshop. There will also be discussions and information sessions focused on the challenges and nuances involved in interpreting and using the data from these analyses.

The workshop will use the high-throughput robotics equipment at the Newcastle University Molecular Diagnostics Facility to expedite the process,

but the equivalent manual processes will also be described and demonstrated throughout. Alongside hands-on demonstrations, there will be various opportunities for breakout discussions around the nuances, intricacies and challenges of these methods. The aim is to instil confidence in participants to apply these methods themselves, but we will also provide an awareness of the nuances and challenges involved to prepare them for best practice application of the molecular analysis of trophic interactions for ecological network construction and analysis.

## **Programme**

### Prior to the event

Some bespoke non-compulsory reading materials, a glossary and the protocol that will be followed throughout the course will be disseminated in advance to ensure that you get the most out of the workshop possible. These will act as a resource throughout the workshop, but should also be useful for applying the same methods in other settings.

### Monday 1<sup>st</sup> September

9:00-10:00	Introduction and overview
10:00-11:30	Collection of samples from Leazes Park
11:30-13:00	Begin DNA extraction (lysis and incubation)
13:00-14:00	Lunch
14:00-15:30	Complete DNA extraction
15:30-17:00	PCR setup and running

### Tuesday 2<sup>nd</sup> September

9:00-10:30	Digital electrophoresis of PCR products
10:30-12:00	Pooling of PCR products
12:00-13:00	Lunch
13:00-16:30	Library preparation
16:30-17:00	Sequencer loading

### Wednesday 3<sup>rd</sup> – Friday 5<sup>th</sup> September

The sequencer will be left running within the conference venue and live run statistics will be displayed.

### Short online post-conference follow-up

Overview of bioinformatics analysis and interpretation  
Group discussions around the pitfalls and problems  
Examples of these methods in practice