



Understanding diet choices in changing environments: optimisation modelling and experiments with free-living blue tits

Supervisory Team: Ross MacLeod, Graeme Ruxton & Ruedi Nager

The ability to understand how animals' behaviour responds to the environment is becoming ever more important in the face of widespread environmental change. A key part of understanding responses to such change is understanding the complex decisions animals have to make. This project will address the topic of optimal diet choice taking into account multiple constraints, which have rarely been considered in diet selection models. Past work has usually considered a single currency, such as energy, so this project will focus on the forager's need to balance multiple currencies.

The student will bring together an exciting combination of behavioural ecology modelling and field experiments using a novel technology to measure choice in free-living individuals under natural conditions. Work will focus on wild blue tits *Cyanistes caeruleus* and the conflict they face between satisfying energy demand and intake of a specific type of nutrients, antioxidants. Antioxidants are important for health, survival and reproduction in a wide range of organisms and from previous work we know these nutrients are important to blue tits. The student will develop novel models of optimal diet choice by combining energetic, ecological and nutrient considerations and then empirically test the predictions in the field using innovative PIT tag technology that allows the monitoring of many wild individuals simultaneously. The study will be carried out at the University of Glasgow's field station, the Scottish Centre for Ecology and the Natural Environment (see photo below). This provides state-of-the-art laboratory and accommodation facilities in the middle of a unique oak forest hosting a large nest box population (450 boxes) on the shore of Loch Lomond. This project will provide excellent training opportunities in mathematical modelling applied to behavioural ecology, designing field experiment, field skills in avian ecology and analysis of behavioural data.



SCENE field station within the Loch Lomond and Trossachs National Park

Funding Details - NERC standard stipend (£13,590 pa + full fees) for 3 years (6 month extension available under some circumstances). 4 studentships are being advertised with the expectation that the 3 most competitive applicants will be funded.

Eligibility - The candidate must have been ordinarily resident in the UK throughout the 3-year period preceding the date of application for an award, not wholly or mainly for the purposes of full time education. Applicants should have received a grade of 2:1 (B) or equivalent in their undergraduate degree; applicants who do not meet this threshold but have completed other postgraduate training programmes might be considered. For more details on eligibility and for applicants see below:

<http://www.nerc.ac.uk/funding/application/studentships/studentbook2010.pdf>

<http://www.gla.ac.uk/colleges/mvls/graduateschool/informationforprospectivestudents/>

How to apply - Cover letter indicating motives and qualifications for undertaking this PhD plus full CV and contact details of at least 2 referees. Initial enquiries to ross.macleod@glasgow.ac.uk, applications to lorna.kennedy@glasgow.ac.uk. **Closing Date – 27th January 2012.**