Postgraduate Research Opportunity: MSc

Project Title: Exploring acoustic communication in Atlantic salmon (Salmo salar) using passive acoustic monitoring and playback experiments

Project Description: Passive acoustic monitoring techniques involve the use of devices such as hydrophones to record sounds produced by animals underwater. There is a growing recognition of the potential of passive acoustic monitoring as a tool in fisheries management (Gannon 2008). Because many fish produce distinctive sounds during specific activities, such as feeding, predator avoidance, territory defence and spawning, passive acoustic techniques may be used to monitor wild populations and provide information on species presence and habitat use (e.g. Hawkins et al. 2002). Passive acoustic methods have advantages over other monitoring techniques (e.g. netting, tagging) as they are non-invasive, low cost and can cover a large survey area (Gannon 2008). It is therefore possible that passive acoustic monitoring could be usefully applied to locate populations and identify preferred habitats of important species of fish (Gammell & O’Brien 2013). But before this type of monitoring can be carried out in the field, it is necessary to identify and catalogue the sounds produced naturally by the species of interest, and the contexts in which those sounds are produced.

The Atlantic salmon (Salmo salar) is a commercially important species that has undergone a serious population decline, the reasons for which are not entirely clear (Thorstad et al., 2012). It is listed on Annex II of the Habitats Directive, requiring the designation of Special Areas of Conservation for its protection. More than 700 species of fish, from at least 30 families, including the Salmonidae, are known to produce sounds (Lagardère et al. 2004, Luczkovich et al. 2008). If sounds produced by Atlantic salmon in different contexts can be recorded and catalogued, subsequent monitoring for those sounds may facilitate population monitoring and the identification of important habitats for salmon in the wild.

The aims of this study are to: (i) record and catalogue sounds produced naturally by different life stages of Atlantic salmon (ii) identify the contexts in which particular sounds are produced; (iii) investigate the behavioural response of Atlantic salmon to recorded sounds using playback experiments. Acoustic and video recording of captive fish will be used to investigate sound production, and responses to recorded sounds, in different contexts. The successful candidate will be expected to publish a number of papers in peer-reviewed journals, and to apply for funding to facilitate continuation of this work at PhD level.

References:


Lagardère et al. (2004). Acoustic characteristics of two feeding modes used by brown trout (Salmo trutta), rainbow trout (Oncorhynchus mykiss) and turbot (Scophthalmus maximus). Aquaculture 240: 607-616.


Research Environment: The successful candidate will join a dynamic group of researchers at the Marine and Freshwater Research Centre at GMIT. The candidate will have access to state of the art equipment and facilities, and will benefit greatly from collaboration with fisheries scientists working at salmon hatcheries in the west of Ireland.

Requirements/Qualifications: Interested candidates should hold an Honours Degree (minimum 2.2, but 2.1 or higher is desirable) in a cognate discipline, e.g. Aquatic Biology, Fisheries, Animal Behaviour, Ecology, or a related discipline. Candidates should have good skills in experimental design and statistical analysis. Experience of recording and analysing acoustic and/or behavioural data is desirable. Ideally, candidates should hold a full driving licence.

Project Duration: 2 years

Conditions:

- Stipend of €13,000 per annum.
- The successful candidate will also gain experience of supporting undergraduate teaching and learning activities.
- Postgraduate fees for EU students will be covered by the project. In addition travel and consumables costs incurred during the project will be funded.

Please Note: Candidates from outside the EU are eligible to apply, but may be expected to provide evidence of sources of additional funds to cover excesses associated with Non-EU fees. The excess is normally €5000 per annum.

Expected Project Start Date: January 2014

Scholarship Application Procedure:

Applicants should submit their Curriculum Vitae and a Personal Statement.

The personal statement should be divided into two sections:

1. The first section should:
   (a) Explain why you have chosen to pursue an MSc research program (in general terms, without reference to this project), and,
   (b) Demonstrate the qualities/skills that you have which equip you for undertaking an MSc research program (in general terms, without reference to this project).

2. In the second section:
   (c) Outline how your previous experience and academic background make you a suitable candidate for this particular project.

Application Closing Date: 2pm on Friday 13th December 2013

Please email your Curriculum Vitae and Personal Statement to: ResearchOffice@gmit.ie

Applications must be submitted to this e-mail address only.

Interviews expected to take place week beginning Monday 6th January 2013

For further information on the project please contact: Dr. Joanne O’Brien at joanne.obrien@gmit.ie and Dr. Martin Gammell at martin.gammell@gmit.ie.