Foras na Mara
Marine Institute

Cullen Scholarship: The impacts of aquaculture on marine birds (PhD Award)

Background

This PhD scholarship topic focuses on how marine birds interact with aquaculture activities, particularly shellfish and finfish. All finfish and shellfish activities conducted within and near protected sites such as Special Protection Areas (SPAs) and Special Areas of Conservation (SACs), are required to go through an Appropriate Assessment process which assesses the risk of the activities on protected habitats and species. Marine birds form a major part of the protected species within SPAs, however there is a lack of information available on the ecology of some species and their likely interactions with aquaculture operations. This PhD would fill in those gaps allowing the Marine Institute to provide accurate scientific advice on the impacts of aquaculture on marine birds.

Proposal

We propose **a structured four-year PhD** on a full-time basis to assess the impacts of aquaculture of marine birds.

The project will aim to answer one or more of the below research questions:

1. *Can population trends of wintering waders be linked to the prevalence of shellfish aquaculture at sites?*

Utilising existing MI low tide survey data at marine aquaculture sites, the scholar will analyse the data to produce trend information on various wading and coastal birds and assess these against the prevalence of aquaculture at the sites.

2. *What, if any, impact does noise and visual disturbance at finfish aquaculture sites have on adjacent breeding seabird colonies?*

Disturbance (both noise and visual) to seabirds at breeding colonies as a result of activities (e.g., vessels, feeding systems) at adjacent aquaculture sites has the potential to exclude birds from foraging grounds and impact their behaviour. This topic will utilise GPS tagging to understand better how birds react to aquaculture activities around breeding colonies and to investigate the effect this disturbance might have both on individuals and at a population level.

3. *What is the over-wintering foraging range and site fidelity of wading birds, divers and ducks? Is there movement between sites and is this movement influenced by the presence of shellfish culture?*

The wintering 'home range' for foraging waders, divers and ducks is poorly understood in Ireland. As is the level of winter site fidelity and movement between sites, some of which could be attributed to aquaculture activities. This topic would include GPS tagging a variety of wintering species in Ireland and

analysing data to establish winter movement, home ranges, habitat preferences and association with shellfish aquaculture.

4. How might expansion of aquaculture activities impact on marine bird populations?

The MI are in the process of developing individual based models for wintering wading species in shellfish aquaculture sites around Ireland. This topic will involve the scholar interrogating existing models and developing new models to answer questions on how different management options might measure impact on wading species at wintering sites in Ireland.

Location of Scholar and Training Provided at the Marine Institute

The scholar will be based for circa 50% of their time over the four years at the Marine Institute HQ Rinville, Galway.

The scholar will be trained in marine bird surveying and tagging techniques, time series and spatial data analysis as well as model development. The scholar will also develop skills in peer review literature writing as well as writing reports providing scientific advice.

Outcome

The expected outcomes from the project will be a series of peer reviewed papers covering the research topics which will contribute to the scholars PhD.

Further outcomes will be the provision of ongoing advice on the impact of aquaculture on marine birds. More specifically, the outputs from these studies will increase the information base relating to ornithological interactions with aquaculture operations and so provide additional scientific rigour and certainty in advice to the Department of Agriculture Food and the Marine to support aquaculture licensing decisions.

Marine Institute Corporate Strategy 2023-2027

Under the strategic priority "Delivering impact through research and innovation" of the Marine Institute's corporate strategy Ocean Knowledge that Informs and Inspires, this research will address strategic initiative number 1 by providing scientific data and knowledge which will form the backbone of our advice to our parent department, Department of Agriculture, Food and the Marine (DAFM) to ensure sustainable food production from aquaculture.

It will also address strategic initiative number 3 by complementing our current goals under the EMFAF data collection programme to support aquaculture licensing.

Finally, it will address strategic initiative number 6 by providing research, knowledge, data and evidence for the consenting of licensing of aquaculture in the Irish maritime area.

Specific Requirements

The applicant should have a background (BSc, MSc) in marine science or related topic. Strong analytical skills in both mapping, modelling and statistical analysis would be beneficial, particularly in R and ArcGIS. Ability and willingness to travel for field work.

The HEI supervisor and/or the student at the university must hold the relevant licenses and training for GPS tagging of marine birds if that forms part of the proposed scholarship.

Financial Details

Scholarships will be up to €34,000 per annum (maximum funding PhD of €136,000 over four years. This amount comprises a maintenance award of €25,000 to the student as well as payment of fees to the host higher education institution (HEI). The maximum fees payable to the HEI will be €6,000 per annum. The scholarship award also includes a budget of up to €3,000 per annum for eligible research costs (travel & subsistence, publication costs, consumables and other costs, such as minor kit purchase e.g. camera) for the sole use of the student and are payable on a reimbursement basis direct to the host institution where the postgraduate student (scholar) is registered. There are no overheads payable on the scholarship.

Publication costs are intended to cover publications on which the scholar is listed as first author and are published under Open Access.

Scholars can also supplement this funding by applying to the Marine Institute's Networking & Marine Research Communication Awards annual call.

In addition, the cost of a laptop will be covered by the Marine Institute (purchased via the Research Funding Office).

Marine Institute Co-Supervisor

Name: Dr Patricia Breen

Service Area: Marine Environment & Food Safety

Email: patricia.breen@marine.ie