

## **Cullen Scholarship: Ropeless gear as a solution to marine mammal entanglement**

### **(PhD Award)**

#### **Background**

Fisheries bycatch represents a large threat to marine mammals with marine animal entanglement in pot (and other static) fishing gear having been a global concern for scientists and conservationists for many years. Entanglement with mooring and recovery lines for these gears is of particular concern, resulting in the drowning of any entangled animals including cetaceans and pinnipeds in addition to species such as basking sharks. Even if the animal is able to escape, it will often suffer injuries, that from observations, can be significant. While the formal reporting of entanglement events is rare, when studies are carried out they can show substantial impacts on these species. In Scotland for example the largest cause of non-natural mortality of stranded baleen whales has been as a result of entanglement in pot and creel gear (Northridge *et al.*, 2010).

The Whale Fisheries Act, 1937 banned the hunting of all cetacean species within Irish territorial waters, as well as the hunting of certain whale species outside of Irish waters by Irish-registered ships. Making Ireland world leaders in this arena, but recently we have been less prominent. Recent work in Ireland and Scotland has indicted that there is a strong interest in this subject among fishers and conservationists leading to the creation of the SEA (Scottish Entanglement Alliance), and moves to establish one in Ireland. This type of initiative can help document the scale and importance of entanglement in fisheries, and provide the basis for mitigation of this threat to these, often endangered, species. Entanglement is also not only a conservation issue, it can also lead to loss of gear for the fishers resulting in economic costs. Thus any potential solutions to reduce entanglements in fishing gear would also be beneficial to fishers.

Ropeless gears are one of the most promising routes to mitigation. These use acoustic release rope systems that avoid having mooring and recovery ropes in the water column. When the fisher wants to recover the gear an acoustic signal is sent and a buoy released with the recovery rope. Such gear has been developed in New England and deployed with success, and it is now being used in Scotland. During recent work carried out as part of a Fulbright Scholarship, interviews with fishers and conservation NGOs have shown considerable interest in this approach in Ireland. One key attraction is that the approach also reduces gear interactions between trawl and other mobile gears with the pot fisheries, by logging the locations of these gears on a mobile app available to all fishers. Very promisingly, an Irish marine electronics manufacturer has expressed interest in building this type of system, as have groups in Scotland and Norway.

#### **Proposal**

We propose a **structured four-year PhD** on a full-time basis to examine and document gear loss and entanglement rates of cetaceans in pot and trap gear in Irish waters and to engage creatively with fishermen to reduce both rates through the application of innovative gear strategies and devices.

The project will aim to:

1. Gather information on marine animal entanglement in Ireland, and relate that to global entanglement information, to place the issue in Ireland in the global context. This will include carrying out surveys and interviews, both to gather information and build relationships with fishers. This work will make use of the network of fishers already collaborating with the EAFM team in FEAS working on the iFISH and SFI RTI projects. It will draw on similar collaborations in Scotland and the US.
2. Carry out systematic and quantitative analysis of entanglement and gear losses, focussing on case studies based on the most economically important sectors. This will be done through collaboration with the Regional and National Inshore Fisheries fora and with BIM.
3. Work with fishers and manufacturers utilising a collaborative, bottom-up approach, to develop and deploy the ropeless systems within inshore fisheries in Ireland, and gather data on their performance.
4. This work will be carried out in collaboration with an international team that has already been established in preliminary form. It includes: University of Connecticut, USA, SEA (Scottish Entanglement Alliance), Runde Environmental Centre and Ocean Space Acoustics AS, Norway.

### **Outcome**

This proposal seeks to collect and provide data for fisheries managers to support a roadmap for pot and other static gear fishing modernization as a conservation method to protect endangered marine mammals, as well as to show the benefit that can be realized by fishers and the health of their target catch, should these gears be implemented in Ireland and world-wide. Further, this proposal allows for that data to be gathered by an international team, thus expanding and assisting in the development of a global market for these innovations.

### **Links to MI Strategy**

This proposal falls principally under Strategic Focus Area 3 - Research & Innovation. This links to Strategic Focus Area 1 – Scientific Advice & Services, specifically in providing advice on the conservation of the marine ecosystem, and in improving advice on fisheries, and specifically the static gear and potting sectors.

### **Specific Requirements**

The scholar should have a primary degree in a natural or ocean science, and ideally a masters level degree in an appropriate field. The scholar should have an interest in both conservation science and fisheries, with proven experience of working with the fishing industry and conservation sectors.

## **Financial Details**

Scholarships will be up to €27,500 per annum (maximum funding of €110,000 over four years). This amount comprises a maintenance award of €18,500 (Irish Research Council rate effective 1-Jan-21) 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 e.g. laptop) 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.

## **Marine Institute Co-Supervisor**

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## **References**

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