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SPECIAL EU PROGRAMMES BODY

Project Case Study: Bryden Centre for Advanced Marine and Bio-Energy Research—Project Update

THEME:

Research and Innovation
Health & Life Sciences
Renewable Energy

FUNDING (ERDF + Match):

€9,365,483.34

MATCH FUNDERS:

Department for Economy NI & Department of Business, Enterprise & Innovation Ireland

LEAD PARTNER:

Queens University

Belfast

PROJECT PARTNERS:

Ulster University; Agri-Food & Biosciences Institute; Letterkenny Institute of Technology; Donegal County Council; University of the Highlands & Islands; and Dumfries & Galloway

PROJECT CONTACT:

Brydencentre@qub.ac.uk

Start Date: 01/06/2017

End Date: 30/06/2022

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Protecting our coasts and seas is increasingly important to safeguard biodiversity and marine resources. Activities such as bottom trawling for seafood as well as increasing numbers of offshore wind, tidal and wave energy generation installations are major concerns. The EU INTERREG VA-funded Bryden Centre, is conducting research that will help prevent and mitigate harm to delicate Flame shell reefs. This highly innovative research, supported by industry partner SSE, will enable improved siting of subsea power transmission cables and better mitigation of any local disturbances to sensitive habitats.

The research is investigating methods to survey and assess damage to the expansive Flame shell reefs found within Loch Carron on the west coast of Scotland. Flame shells form delicate nests made of algae, pebbles, and debris to completely cover themselves on the seabed but are very vulnerable to physical disturbance. Occurrences of Flame shells forming expansive reefs are only found in Scotland and Northern Ireland and the reefs form valuable nursery grounds for marine life.

The reefs in Loch Carron were damaged by the pass of a scallop trawler in 2017. Following extensive media coverage and outcry from stakeholders, action was taken to designate parts of the Loch as an emergency Marine Protected Area (MPA) to protect the Flame shell beds with permanent designation as an MPA in May 2019. This event exposed the lack of understanding around many aspects of this species given its status as a priority marine feature in Scotland. Understanding how Flame shells are impacted by disturbances, such as cable laying, and its potential to recover is essential to improve cable siting and licensing use of the coastal seabed.

Limaria hians (the flame shell) is a species of saltwater clam

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Expensive and time-consuming diver surveys are currently the most effective means to locate and monitor flame shells as they are difficult to detect due to their ability to conceal themselves underneath nest material. The approach adopted by the project was to use an underwater Remotely Operated Vehicle (ROV) to confirm locations of high and intermediate coverage and also where flame shells were absent. Next, a multi-beam echo-sounder (a device which uses soundwaves to map the seabed) attached to an Autonomous Underwater Vehicle (AUV) was used to survey the same seabed. Comparison to the ROV data allowed the team to determine whether the AUV approach could detect Flame shells remotely and allow rapid assessment of the scale and condition of these reefs.

Initial results showed AUV surveys were successful at detecting areas of damage within the reef that are consistent with scallop trawling. Further analysis is required of the data, but the work has shown that the method is effective at detecting large scale physical disturbance and has potential for rapid deployment after a suspected event. A planned follow up survey of the same area will allow observation of how the reef has changed over one year and the rate of recovery or contraction of both healthy and damaged reef.

The project has substantially increased the existing knowledge base of Flame shells and improved ability to mitigate for any potential disturbance from fishing impacts or infrastructure development. Being able to detect these reef habitats during the scoping phase of a transmission cable survey will allow for early mitigation and planning without the need for potential costly deviations during cable laying operations. The study was also partly supported by the EU INTERREG VA-funded MarPAMM project and involved the Scottish Association of Marine Science and Ulster University.

Deep trekker—Autonomous Underwater Vehicle