

Application for Consent to conduct  
Marine Scientific Research

Date: 9/1/18\_\_\_\_\_

1. General Information

1.1 Cruise name and/or number:
CV18012
Distribution of <i>Nephrops</i> larvae and associated oceanographic conditions

1.2 Sponsoring Institution(s):	
Name:	Marine Institute
Address:	Rinville, Oranmore, Co. Galway, Ireland
Name of Director:	Dr Peter Heffernan

1.3 Scientist in charge of the Project:	
Name:	Ryan McGeady
Country:	Ireland
Affiliation:	NUI Galway/Marine Institute
Address:	Room 101, Martin Ryan Building, NUI Galway, College Road, Ireland
Telephone:	00353 866637257
Fax:	
Email:	r.mcgeady1@nuigalway.ie
Website (for CV and photo):	<a href="http://www.nuigalway.ie/science/school-of-natural-sciences/disciplines/zoology/research/ryanmcgeady/">http://www.nuigalway.ie/science/school-of-natural-sciences/disciplines/zoology/research/ryanmcgeady/</a>

1.4 Entity(ies)/Participant(s) from coastal State involved in the planning of the project:	
Name:	
Affiliation:	
Address:	
Telephone:	
Fax:	
Email:	
Website (for CV and photo):	

2. Description of Project

2.1 Nature and objectives of the project:
<p>The purpose of the survey is multifold and involves a larval survey of <i>Nephrops norvegicus</i> in the western Irish Sea, acoustic measurements of fish shoals and interactions with trawling gear and collection of oceanographic data including hyperspectral light measurements.</p> <p>The objectives of the survey are as follows:</p> <ol style="list-style-type: none"> <li>I. To examine diel vertical migration behaviour within <i>Nephrops</i> larvae.</li> <li>II. To investigate the effect of thermal stratification on vertical distribution of these larvae.</li> <li>III. To identify biotic and abiotic variables that may influence larval vertical distribution and peak abundance.</li> <li>IV. To collect samples for comparison of larval length between discrete populations.</li> <li>V. To collect samples which will provide information on temperature-dependent development rates of <i>Nephrops</i> larvae.</li> <li>VI. To use the knowledge gained to increase accuracy of larval transport model inputs.</li> </ol>

- VII. To compare acoustic records of pelagic fish aggregations with variables such as water column structure, temperature, dissolved oxygen content, time of day and benthic topography.
- VIII. To observe the effect of trawling on remaining fish once a trawl has passed through.
- IX. To assist in Irish satellite validation efforts by collecting surface water properties.

2.2 If designated as part of a larger scale project, then provide the name of the project and the Organisation responsible for coordinating the project:

The survey will contribute to the following projects:

- Cullen Fellowship: Oceanographic modelling of *Nephrops* populations around Ireland. (NUI Galway/Marine Institute)
- Cullen Fellowship: Space based observations of marine phytoplankton in NE Atlantic surface water masses – environmental monitoring applications. (NUI Galway/Marine Institute)
- Irish Research Council Government of Ireland Postgraduate Scholarship: Modelling the shoaling behaviour of mackerel (*Scomber scombrus*) in the field to improve stock assessment methods and indicate stock condition. (NUI Galway)

2.3 Relevant previous or future research projects:

N/A

2.4 Previous publications relating to the project:

None

### 3. Geographical Areas

3.1 Indicate geographical areas in which the project is to be conducted (with reference in Latitude and longitude in decimal degrees, including coordinates of cruise/track/way points/sampling stations). Please provide coordinates in a separate excel spreadsheet.

Northern boundary: 53.987

Southern boundary: 53.585

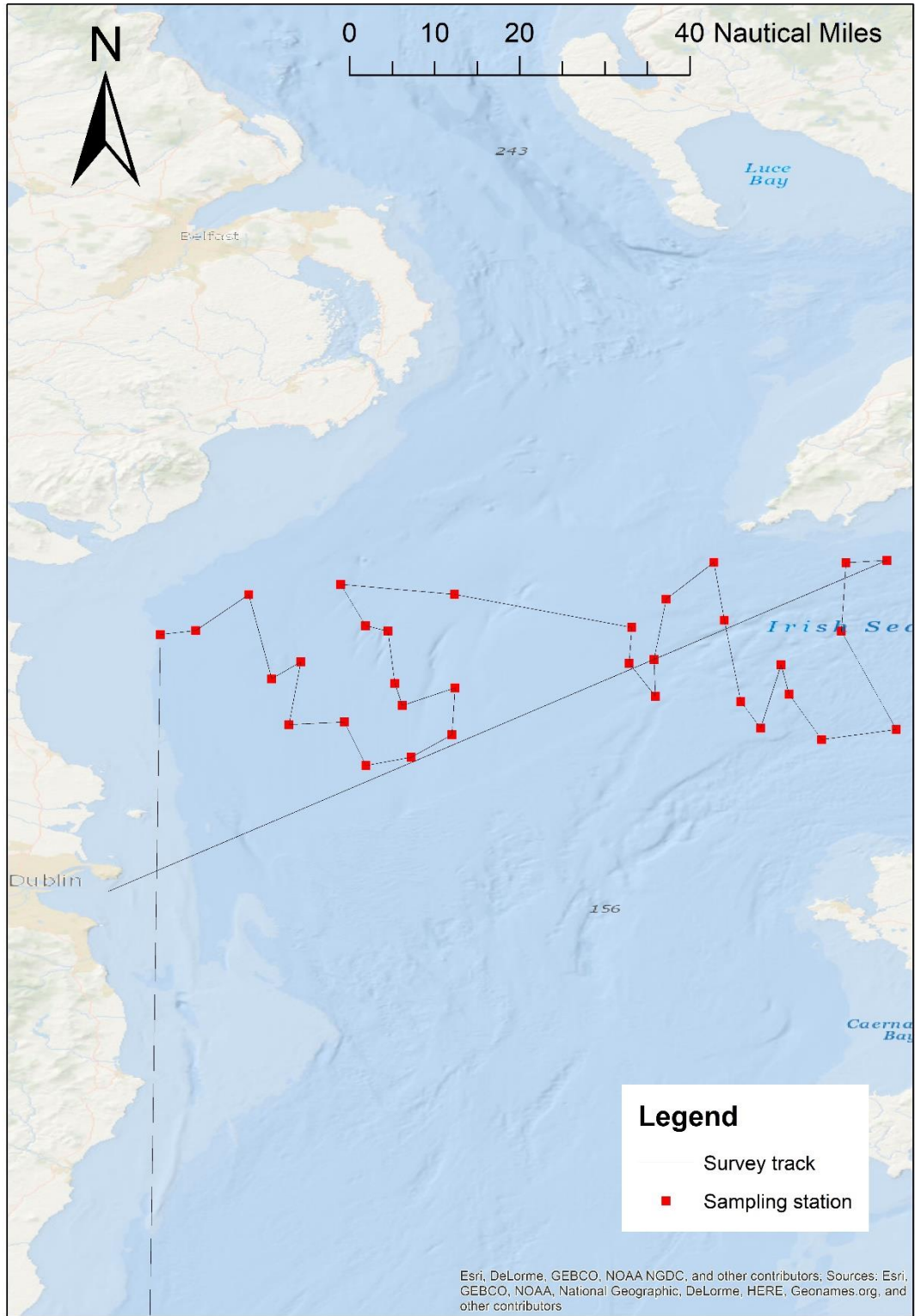
Western boundary: -5.968

Eastern Boundary: -4.526

Station	Multinet	CTD	Hyperspectral radiometer	Shoal detection	Longitude	Latitude
1	✓	✓	✓	✓	-5.968	53.841
2	✓	✓	✓	✓	-5.899	53.849
3	✓	✓	✓	✓	-5.795	53.919
4	✓	✓	✓	✓	-5.75	53.755
5	✓	✓	✓	✓	-5.693	53.788
6	✓	✓	✓	✓	-5.716	53.665
7	✓	✓	✓	✓	-5.607	53.67
8	✓	✓	✓	✓	-5.565	53.585
9	✓	✓	✓	✓	-5.477	53.602
10	✓	✓	✓	✓	-5.397	53.645
11	✓	✓	✓	✓	-5.39	53.737
12	✓	✓	✓	✓	-5.495	53.702
13	✓	✓	✓	✓	-5.509	53.746
14	✓	✓	✓	✓	-5.523	53.849
15	✓	✓	✓	✓	-5.566	53.859
16	✓	✓	✓	✓	-5.615	53.939
17	✓	✓	✓	✓	-5.392	53.92

18	✓	✓	✓	✓	-5.045	53.854
19	✓	✓	✓	✓	-5.05	53.785
20	✓	✓	✓	✓	-4.998	53.72
21	✓	✓	✓	✓	-5.001	53.793
22	✓	✓	✓	✓	-4.977	53.911
23	✓	✓	✓	✓	-4.883	53.983
24	✓	✓	✓	✓	-4.864	53.87
25	✓	✓	✓	✓	-4.83	53.711
26	✓	✓	✓	✓	-4.792	53.659
27	✓	✓	✓	✓	-4.751	53.781
28	✓	✓	✓	✓	-4.736	53.724
29	✓	✓	✓	✓	-4.673	53.636
30	✓	✓	✓	✓	-4.526	53.656
31	✓	✓	✓	✓	-4.633	53.848
32	✓	✓	✓	✓	-4.624	53.981
33	✓	✓	✓	✓	-4.544	53.987

3.2 Attach chart(s) at an appropriate scale (1 page, high-resolution) showing the geographical Areas of the intended work and, as far as practicable, the location and depth of sampling Stations, the tracks of survey lines, and the locations of installations and equipment.



**Figure 1.** Preliminary research survey track for RV Celtic Voyager as planned for April 2018, track shown in black and sampling stations in red.

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#### 4. Methods and means to be used

4.1 Particulars of vessel:	
Name:	R.V. Celtic Voyager
Type/Class:	100 A1 Research Vessel, LMC
Nationality (Flag State):	Irish
Identification Number (IMO/Lloyds No.):	
Owner:	Marine Institute
Operator:	P&O Maritime Services
Overall length (meters):	31.4
Maximum draught:	4m
Displacement/Gross Tonnage:	340
Propulsion:	Wärtsilä UD25M5 (626 kW),
Cruising & maximum speed:	<= 10 knots
Call sign:	EIQN
INMARSAT number and method and capability of communication (including emergency frequencies):	GMDSS A class, E-mail. Mini M SAT C and GSM 00 353 91 423396 / 00870 763066755 00870-764687325 / 764687326
Name of Master:	Philip Baugh/Colin McBrearty
Number of Crew:	7
Number of Scientists on board:	8 max

4.2 Particulars of Aircraft:	
Name:	
Make/Model:	
Nationality (flag State):	
Website for diagram & Specifications:	
Owner:	
Operator:	
Overall Length (meters):	
Propulsion:	
Cruising & Maximum speed:	
Registration No.:	
Call Sign:	
Method and capability of communication (including emergency frequencies):	
Name of Pilot:	
Number of crew:	
Number of scientists on board:	
Details of sensor packages:	
Other relevant information:	

4.3 Particulars of Autonomous Underwater Vehicle (AUV):	
Name:	
Manufacturer and make/model:	
Nationality (Flag State):	
Website for diagram & Specifications:	
Owner:	
Operator:	
Overall length (meters):	
Displacement/Gross tonnage:	
Cruising & Maximum speed:	
Range/Endurance:	

Method and capability of communication (including emergency frequencies):	
Details of sensor packages:	
Other relevant information:	

4.4 other craft in the project, including its use:

4.5 Particulars of methods, full description of scientific instruments to be used (for fishing gear specify type and dimension) and location

Types of samples and Measurements:	Methods to be used:	Instruments to be used:	To be carried out within 12nm (yes or no):
Biological - Plankton samples (western Irish Sea)	Multiple plankton sampler deployed to sample 5 discrete depth strata (bottom-40m, 40m-30m, 30m-20m, 20m-10m & 10m-surface)	MultiNet type midi	To be carried out between 5 and 35nm
Temperature, salinity, dissolved oxygen & turbidity (Western Irish Sea)	Vertical cast	CTD	To be carried out between 5 and 35nm
Light (Western Irish Sea)	Light meter deployed through entire water column at each station	RAMES Hyperspectral Radiometer	To be carried out between 5 and 35nm
Acoustic	An Echo Sounder will be used to identify fish shoaling behaviour.	EK60 Scientific Echo Sounder	To be carried out between 5 and 35nm
Biological – Shoal sampling (Western Irish Sea)	If time allows, the pelagic trawl will be used to identify the species composition of identified shoals.	Pelagic trawl	To be carried out between 5 and 35nm

4.6 Indicate nature and quantity of substances to be released into the marine environment:  
N/A

4.7 Indicate whether drilling will be carried out. If yes, please specify:  
N/A

4.8 Indicate whether explosives will be used. If yes, please specify type and trade name, Chemical content, depth of trade class and stowage, size, depth of detonation, frequency of Detonation, and position in latitude and longitude:  
N/A

## 5. Installations and Equipment

Details of installations and equipment (including dates of laying, servicing, method and Anticipated timeframe for recover, as far as possible exact locations and depth, and

Measurements):
N/A

6. Dates

6.1 Expected dates of first entry into and final departure from the research area by the research vessel and/or other platforms:
First entry: 8/4/18 Final departure: 16/4/18
6.2 Indicate if multiple entries are expected:
Yes

7. Port Calls

7.1 Dates and Names of intended ports of call:
N/A

7.2 Any special logistical requirements at ports of call:
N/A

7.3 Name/Address/Telephone of shipping agent (if available):

8. Participation of the representative of the coastal State

8.1 Modalities of the participation of the representative of the coastal State in the research Project:
N/A

8.2 Proposed dates and ports for embarkation/disembarkation:
Start: 3.4.18 Galway End: 16.4.18 Dublin

9. Access to Data, Samples and Research Results

9.1 Expected dates of submission to coastal State of preliminary report, which should include
The expected dates of submission of the data and research results:
Preliminary report will be provided to the coastal state upon request.

9.2 Anticipated dates of submission to the coastal State of the final report:
Final report will be provided to the coastal state upon request.

9.3 Proposed means for access by coastal State to data (including format) and samples:
Access to data and samples will be provided to the coastal State upon request.

9.4 Proposed means to provide coastal State with assessment of data, samples and
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Research results:
Assessment of data, samples and research results will be provided to the coastal State upon request.

9.5 Proposed means to provide assistance in assessment or interpretation of data, samples And research results:
Assistance in assessment or interpretation of data, samples and research results will be provided to the coastal State upon request.

9.6 Proposed means of making results internationally available:
Cruise Report will be made publically available.

10. Other permits Submitted

10.1 Indicate other types of coastal state permits anticipated for this research (received or Pending):
N/A

11. List of Supporting Documentation

11.1 List of attachments, such as additional forms required by the coastal State, etc.:
N/A

Signature: *Ryan McGeady*

Contact information of the focal point:

Name: Ryan McGeady  
Country: Republic of Ireland  
Affiliation: National University of Ireland, Galway  
Address: Room 101, Martin Ryan Building, NUI Galway, College Road, Ireland  
Telephone: 00353 866637257  
Fax:  
Email: r.mcgeady1@nuigalway.ie