Application for Consent to conduct
Marine Scientific Research

Date: 30/05/2018

1. General Information

1.1 Cruise name and/or number: A multi-disciplinary survey of an offshore killer whale community that associate with the Northeast Atlantic mackerel fishery. Cruise No. **CV18033**

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

1.3 Scientist in charge of the Project:	
Name:	Róisín Pinfield
Country:	Ireland
Affiliation:	University College Cork
Address:	School of Biological, Earth and Environmental Sciences, Distillery Field Campus, North Mall, University College Cork, Cork
Telephone:	00353 21 4904676 or 00353 87 1210121
Fax:	N/A
Email:	R.Pinfield@ucc.ie
Website (for CV and photo):	https://www.linkedin.com/in/roisin-pinfield-b2620a62/

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

2. Description of Project

2.1 Nature and objectives of the project:
1) Carry out a sightings-based survey design to model the distribution of killer whales in the study area and to determine if killer whale distribution is heavily influenced by location of mackerel fishing vessels and/or activity of fishing vessels (steaming/trawling/hauling/fish pumping) 2) Take high quality images of killer whales for individual identification, calculating abundance, group composition, social structure and compare with killer whale catalogues from surrounding countries namely, Iceland, Norway and Scotland and UCC's catalogue of this killer whale community to gain insights into site/fishery fidelity and year-round movements of this community. 3) Take skin biopsies to carry out genetic and stable-isotope analyses to reveal population structure and diet. 4) Environmental DNA sampling for genetic analyses. DNA will be extracted from filtered seawater samples and tested for the presence of killer whale mitochondrial DNA.

5) Collect acoustic data, specifically individual signature whistles with the use of a dipping hydrophone, for comparison with other killer whale populations in the Northeast Atlantic to further aid in identifying geographical range and population connectivity.
6) Gather aerial footage with the use of a drone to examine the foraging behaviour and movements of the killer whales around the fishing vessels and to determine if a feeding hierarchy exists.

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 proposed survey is part of a larger scale PhD project entitled, 'Biology and ecology of Killer whales (*Orcinus orca*) foraging around pelagic trawlers in the northeast Atlantic', being carried out in University College Cork, Ireland

2.3 Relevant previous or future research projects:

This work is part of an on-going project to examine killer whale/mackerel fisheries interactions. Previous work (Luque et al. 2006; Pinfield et al. (in review)) has suggested that this association has occurred for at least the last decade, but it is not known how many individuals are involved in this interaction, whether they are genetically distinct and whether they are exclusively mackerel/fish eaters.

2.4 Previous publications relating to the project:

No publications have been produced yet but at least three scientific papers will be published in peer review journals relating to foraging behaviour, population structure, diet and geographical range of this aggregation of killer whales.

2. 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.

The survey study area will be located in the North Sea, south of Shetland, Scotland.

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.

We will not have any sampling stations, we will be carrying out seawater sampling if and when we encounter killer whales but not in any pre-defined locations. Seawater sampling will be carried out at approximately 1m below the sea surface.
Survey lines have not been set out as they will depend on the location of the Northeast Atlantic mackerel fishing grounds at the time which based on the last two years should be inside the survey area defined in the chart but we will not know this location for sure until the days leading up to the survey as this fishery occurs during the mackerel migration and so is dependent on the movements of the fish which has varied slightly over the past number of years. Once we are aware of the location we will set out survey lines. Our main aim will be to get to the fishing grounds, contact skippers for sightings and move towards any sightings reported. The majority of the Irish and a small number of the Shetland skippers are aware of the killer whale research being carried out by the Chief Scientist/PhD researcher Róisín Pinfield and have been very supportive. Contact will be made before the survey to inform the skippers and encourage cooperation.
There will be no installations of equipment.

3. 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: Celtic Voyager's Rigid Inflatable Boat (RIB). Deployment of RIB from Celtic Voyager in seastates ≤3 (Beaufort scale) in order to get closer to the killer whales for biopsy sampling, collection of photo-identification images and environmental DNA sampling. Three scientists required plus one Marine Institute crew member to drive the RIB.

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):
Skin samples	Biopsy sampling	PAXARMS biopsy rifle	no
Seawater sampling	Collecting seawater with sterile containers	eDNA sample pole	yes
Killer whale photos	SLR camera	Canon EOS 1D Mark II with 70 – 300mm lens	yes

4.6 Indicate nature and quantity of substances to be released into the marine environment:
Non-applicable

4.7 Indicate whether drilling will be carried out. If yes, please specify:
Non-applicable

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:
Non-applicable

4. 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):
Non-applicable

5. 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: 27/10/2018 Final departure:01/11/2018
6.2 Indicate if multiple entries are expected:
No

6. Port Calls

7.1 Dates and Names of intended ports of call:
None

7.2 Any special logistical requirements at ports of call:
Non-applicable

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

7. 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:
Non-applicable

8.2 Proposed dates and ports for embarkation/disembarkation:
Non-applicable

8. 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:
Non-applicable as coastal state is not involved in the planning or running of the survey

9.2 Anticipated dates of submission to the coastal State of the final report:
Non-applicable

9.3 Proposed means for access by coastal State to data (including format) and samples:
The ship's cruise report for the survey can be supplied on request

9.4 Proposed means to provide coastal State with assessment of data, samples and Research results:
A report can be supplied, and any publications will be forwarded on request

9.5 Proposed means to provide assistance in assessment or interpretation of data, samples And research results:
A report can be supplied, and any publications will be forwarded on request. The Chief scientist can be contacted for to assist with interpretation of the results from the survey.

9.6 Proposed means of making results internationally available:
Publication of the results in peer-reviewed journals

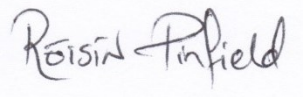
10. Other permits Submitted

10.1 Indicate other types of coastal state permits anticipated for this research (received or Pending):
No biopsy permit required as biopsying outside the 12nm limit in UK waters does not require an ASPA licence (personal communication with Dr Kim Willoughby, Wildlife lead, UK Home Office). We will not be attempting biopsies inside the 12nm limit. Hold a valid Scottish Natural Heritage licence to approach by boat and track and photograph killer whales in Scottish waters within 12 nautical miles of the shore.

11. List of Supporting Documentation

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

Scottish Natural Heritage Permit – 85261.pdf

Signature: 

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