

**Application for Consent to Conduct Marine Scientific Research
in Areas Under National Jurisdiction of**

Iceland

(name of coastal state)

Date: 19 December, 2014

1. General Information

1.1 Cruise name and/or #:	Jan Mayen 2015 Body condition trial
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1.2 Sponsoring institution:	* please see attached information for full list of sponsors/funders
Name:	University of St Andrews
Address:	College Gate, St Andrews, Fife KY16 9AJ, Scotland, United Kingdom
Name of Director:	Prof. Louise Richardson

1.3 Scientist in charge of the project (include CV and passport photo):	
Name:	Dr. Patrick Miller
Address:	School of Biology, Bute Building, room B6, St Andrews, Fife KY16 9QQ
Telephone:	44-1334463554
Fax:	44-1334462595
Email:	pm29@st-andrews.ac.uk

1.4 Scientist(s) from coastal state involved in the planning of the project:	
Name(s):	Gisli Vikingson
Address:	Marine Research Institute (HAFRO), Skúlagata 4; IS - 101 Reykjavík Iceland

1.5 Submitting officer:	
Name and address:	Patrick Miller School of Biology Bute Building, B6 Westburn Lane St Andrews, Fife KY16 9QQ
Nationality:	USA, Settlement status in Britian
Telephone:	+44 (0) 1334 463554
Fax:	
Email:	pm29@st-andrews.ac.uk

2. Description of Project (Attach additional pages as necessary)

2.1 Nature and objectives of the project:
The objective of the research is to record data on the natural behavior of cetacean species (Northern bottlenose whale, blue whale, killer whale, humpback whale) in the waters ranging from Northern Iceland to Jan Mayen. Whales will be found at sea, and then approached for research data collection, including: photo-identification, biopsy sample collection, attachment of tags (ranging from 1-60 day durations), scanning using high-frequency (375 kHz sonar), recording of underwater sounds, and playback of sounds using an underwater loud-speaker.

2.2 Relevant previous or future research cruises:

Similar trials have been conducted by the 3S collaboration in the waters off Spitsbergen (2011, 2012) and in waters off Jan Mayen (2013, 2014). Two trials have been conducted in the Gully, off Nova Scotia, Canada (2011).

2.3 Previously published research data relating to the project:

Cruise reports are available for all of the cruises conducted to date, by emailing Patrick Miller (pm29@st-andrews.ac.uk)

3. Methods and Means to be Used

3.1 Particulars of vessel:

Name:	M/V Hildur
Nationality (Flag state):	Icelandic
Owner:	Norðursigling/North Sailing
Operator:	Norðursigling/North Sailing
Overall length (meters):	26m
Maximum draught (meters):	2.34m
Displacement/Gross tonnage:	35
Propulsion:	sailing vessel, diesel motor
Cruising & Maximum speed:	6 knots, 7.5 knots
Call sign:	TFTN
Method and capability of communication (including emergency frequencies):	The vessel is fully equipped with GPS, AIS, SSB & VHF radio and Inmarsat.
Name of master:	Heimir Harðarson
Number of crew:	3 persons in addition to master
Number of scientists on board:	Variable (up to 8)

3.2 Aircraft or other craft to be used in the project:

None

3.3 Particulars of methods and scientific instruments

Types of samples and data	Methods to be used	Instruments to be used
Photo-identification images	Photography	Canon and Nikon cameras
Biopsy sample	Remote collection of skin and 60mm blubber samples	Finn-Larsen biopsy tips, ARTS launching system, LK Darts
Behavior logger recordings	Remote attachment of tags using suction cups	Dtags, Little Leonardo 3M loggers and camera logger
Movement and dive telemetry tag data	Remote attachment of tags using minimally-invasive barb tags	Wildlife computers SPLASH tags
Observational data	Visual observation from vessel	Data-logging computer
Scanning sonar	Scanning of whales from the vessel using 375 kHz sonar	CodaOctopus Echoscope
Playback of sounds	Sounds will be played back at normal sound levels during observation periods	Lubell underwater speaker.
Underwater sound recordings	Deployment of bottom mounted recording buoy with	DSG-ST Ocean Acoustic Logger, with aluminium

	acoustic release	housing
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3.4 Indicate whether harmful substances will be used:
NONE

3.5 Indicate whether drilling will be carried out:
NONE

3.6 Indicate whether explosives will be used:
NONE

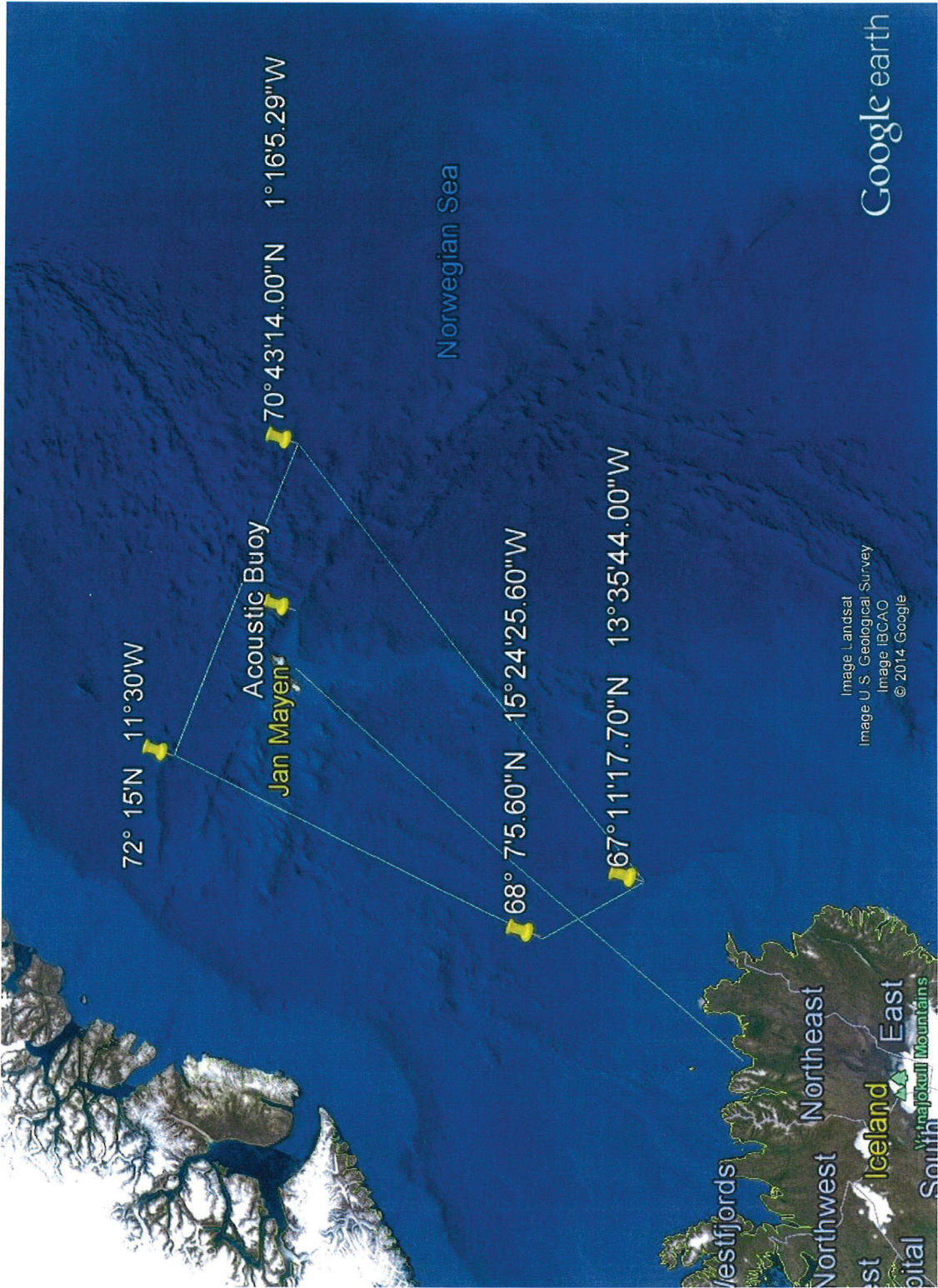
4. Installations and Equipment

Details of installations and equipment (dates of laying, servicing, recovery; exact locations and depth):
An acoustic buoy will be deployed in waters close to Jan Mayen on 03-05 June 2015, will be recovered on 24 June 2-15 and redeployed. Buoy will then be recovered in June 2016. Buoy will be deployed to the seafloor (ideally 1000m depth) at 70°53'43.20"N 7° 1'13.50"W.

5. Geographical Areas

5.1 Indicate geographical areas in which the project is to be conducted (with reference in latitude and longitude):
In waters north of Iceland toward, and Norwegian waters around Jan Mayen. Transit to Jan Mayen will be fairly direct from Husavik, but we will work with animals encountered between Iceland and Jan Mayen. Work area around Jan Mayen is bound by four corners: 70°43'14.00"N 1°16'5.29"W; 72° 15'N 11°30'W; 68° 7'5.60"N 15°24'25.60"W; 67°11'17.70"N 13°35'44.00"W . There are no fixed transits, we will follow whales and good weather in the study area.

5.2 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 positions of intended stations, the tracks of survey lines, and the locations of installations and equipment.



6. Dates

6.1 Expected dates of first entry into and final departure from the research area of the research vessel:

01 June entry, 28 June departure

6.2 Indicated if multiple entry is expected:

An optional port call to Iceland is planned for 12 June, 2015

7. Port Calls

7.1 Dates and names of intended ports of call:

12 June, 2015 Husavik, Iceland

7.2 Any special logistical requirements at ports of call:

none

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

n/a

8. Participation:

8.1 Extent to which coastal state will be enabled to participate or to be represented in the research project:

Input has been sought from Dr. Gisli Vikingson regarding study goals.

8.2 Proposed dates and ports for embarkation/disembarkation:

28 May Husavik, Iceland // 28 June Husavik Iceland

9. Access to data, samples and research results

9.1 Expected dates of submission to coastal state of preliminary reports, which should include the expected dates of submission of the final results:

20 December, 2015

9.2 Proposed means for access by coastal state to data and samples:

Direct email request to Patrick Miller at the University of St Andrews

9.3 Proposed means to provide coastal state with assessment of data, samples and research results or provide assistance in their assessment or interpretation:

Cruise reports will be available and one copy will be sent to Gisli Vikingson

9.4 Proposed means of making results internationally available:

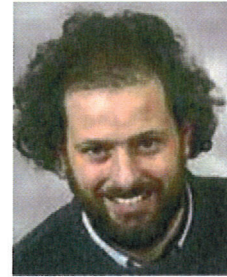
Publications will be made in peer-review journals.

(Revised June 5, 2002)

Patrick James O'Malley Miller

Curriculum vitae

Senior Research Fellow and Reader
Sea Mammal Research Unit, Gatty Marine Laboratory
School of Biology, University of St. Andrews
Saint Andrews, Fife KY16 8LB Scotland
+44 (0) 1334 462658 pm29@st-andrews.ac.uk



Nationality: USA **Birthdate:** April 21, 1965 **Languages:** English, Italian, Japanese

Education:

- PhD in Biological Oceanography, Joint degree from the Woods Hole Oceanographic Institution, Woods Hole, MA and the Massachusetts Institute of Technology, Cambridge, MA. September 2000. Thesis: "Maintaining contact: design and use of acoustic signals in killer whales, *Orcinus orca*". Advisor: Peter L. Tyack

- Bachelor of Science in Zoology, University of Washington, Seattle; with distinction, 1994

- Bachelor of Science in Foreign Service, Georgetown University, Washington, DC; Japanese/Asian Studies Certificate. Study Abroad: Sophia University, Tokyo, 1988.

Work Experience:

- School of Biology, Sea Mammal Research Unit, University of St. Andrews, April 2006 - present. Senior Research Fellow and Reader (promoted August 2013)

- Sea Mammal Research Unit, University of St. Andrews, October 2002 – April 2006. Royal Society USA/Canada Research Fellow

- Sea Mammal Research Unit, University of St. Andrews, October 2004 – October 2005. Head of instrumentation group

- Woods Hole Oceanographic Institution, 2000-present. Postdoctoral Investigator

- Massachusetts Institute of Technology, 2001-2002. Postdoctoral Associate.

- Chuo Trust & Banking, New York Branch. 1989-1991. Assistant VP, loan officer.

5 Recent Publications:

Miller P. J. O., Antunes, R. N., Wensveen, P. J., Alves, A. C., Kvadsheim P. H., Kleivane L., Lam F. P. A., Ainslie M. A., Tyack P. L., and Thomas, L. 2014. Dose-response relationships for the onset of avoidance of sonar by free-ranging killer whales (*Orcinus orca*). *Journal of the Acoustical Society of America*. 135, 975-993.

Fahlman, A., Tyack, P. L., **Miller**, P. J. O. and Kvadsheim, P. 2014. How man-made interference might cause gas bubble emboli in deep diving whales. *Frontiers in Physiology*, vol 5, 00013.

von Benda-Beckman, A., Wensveen, P. J., Kvadsheim, P., Lam, F. P., **Miller**, P. J. O., Tyack, P. L. and Ainslie, M. 2014. Modeling effectiveness of gradual increases in source level to mitigate effects of sonar on marine mammals. *Conservation Biology* 28, 119-128.

Antunes, R., Kvadsheim, P. H., Lam, F. P. A., Tyack, P. L., Thomas, L., Wensveen, P. J. & **Miller**, P. J. O. 2014. High thresholds for avoidance of sonar by free-ranging long-finned pilot whales (*Globicephala melas*). *Marine Pollution Bulletin* 83, 165-180.

Alves, A., Antunes, R., Bird, A., Tyack, P. L., **Miller**, P. J. O., Lam, F-P. A. & Kvadsheim, P. H. 2014. Vocal matching of naval sonar signals by long-finned pilot whales (*Globicephala melas*). *Marine Mammal Science* 30, 1248-1257.

Other Publications

Miller, P. J. O., Biuw, M., Watanabe, Y. Y., Thompson, D., and Fedak, M. A. 2012. Sink fast and swim harder! Round trip cost-of-transport for buoyant divers. *Journal of Experimental Biology*, 215, 3622-3630.

Aoki, K., Watanabe, Y.Y., Crocker, D. E., Robinson, P. W., Biuw, M., Costa, D. P., Miyazaki, N., Fedak, M. A., and **Miller**, P. J. O. 2011 Northern elephant seals adjust gliding and stroking patterns with changes in buoyancy: validation of at-sea metrics of body density. *Journal of Experimental Biology*. 214, 17, p. 2973-2987

Sato, K., Watanuki, Y., Takahashi, A., **Miller, P. J. O.** et al. 2006. Stroking frequency, but not swimming speed, is related to body size in free-ranging seabirds, pinnipeds and cetaceans. *Proceedings of the Royal Society B* DOI: doi:10.1098/rspb.2006.0005

Miller, P. J. O., Johnson, M. P. and Tyack, P. L. 2004 Sperm whale behaviour indicates the use of rapid echolocation click buzzes "creaks" in prey capture *Proceedings of the Royal Society B* 271, 2239-2247. DOI: 10.1098/rspb.2004.2863

SYNERGISTIC ACTIVITIES

University of Tokyo, Tokyo, Japan, June – Sept 2006; and Sept – Oct 2011. Visiting Professor

2006-2014 Invited policy panels for effects of noise on marine life

2002-present Guest Investigator, Woods Hole Oceanographic Institution

Editor for PLOS-One. Guest editor for special edition of Deep-Sea Research II. Reviewer for: Proc. Of the Royal Society, J. Experimental Biology, Animal Behaviour; Ecology, Journal of the Acoustical Society of America; Marine Mammal Science, Royal Society Letters, Behavioral Ecology Sociobiology, Aquatic Mammals, Journal of the Marine Biological Association, Naturwissenschaften

Co-organized 2nd International Symposium on Biologging Science, 2005. St. Andrews

Collaborators

K. Sato	V. Deecke	P. Madsen	P. Tyack
Y. Watanabe	K. Aoki	M. Johnson	P. Kvadsheim
D. Costa	P. Robinson	M. Rasmussen	N. Miyazaki
M. Fedak	D. Crocker	A. Foote	M. Amano

Graduate and postgraduate advisors (1st column) and advisees

P. Tyack	F. Samarra	P. Wensveen	S. Isojunno
P. Slater	R. Swift	A. Nousek-McGregor	R. Antunes
D. Ketten	E. Hartvig	M. Lopez	C. Curé