

MARINE RECORD

Open Access



First confirmed sighting of Sowerby's beaked whale (*Mesoplodon bidens* (Sowerby, 1804)) with calves in the Northeast Atlantic

Simon Berrow^{1*}, Rossa Meade¹, Michael Marrinan², Enda McKeogh² and Joanne O'Brien¹

Abstract

Two sightings are reported of Sowerby's beaked whales with calves off western Ireland. Despite individuals of the species being occasionally stranded in the UK and Ireland, these are the first at-sea sightings of calves in the north-east Atlantic. This record contributes to our knowledge of a poorly known species.

Keywords: Sowerby's beaked whale, Calves, Breeding, Western Ireland

Background

The family Ziphiidae are a poorly known but widespread family of cetaceans distributed worldwide (MacLeod et al. 2006). In the northeast Atlantic at least six species have been recorded with five of these reported from Irish waters. Northern bottlenose whale (*Hyperoodon ampullatus* (Forster, 1770)) and Cuvier's beaked whale (*Ziiphius cavirostris* (G. Cuvier, 1823)) are the most frequently sighted and stranded species in Ireland, while Gervais' beaked whale (*Mesoplodon europaeus* (Gervais, 1855)) is known only from a single stranding in January 1989 (Bruton et al. 1989). Two other *Mesoplodon* species have been recorded: True's beaked whale (*Mesoplodon mirus* (True, 1913)) from 14 stranding events but only one likely sighting (O'Cadhla et al. 2004) and Sowerby's beaked whale (*Mesoplodon bidens* (Sowerby, 1804)). Blainville's beaked whales (*Mesoplodon densirostris* (de Blainville, 1917)) have been stranded twice in the UK (Rob Deaville CSIP *pers. comm*) but have yet to be recorded in Irish waters.

Sowerby's beaked whale distribution is restricted to the North Atlantic, occurring from Massachusetts, USA to Labrador, Canada in the western Atlantic, and from Iceland to Norway in the eastern Atlantic (Mead 1989; MacLeod et al. 2006). It has the most northerly

distribution of any of the Atlantic species of *Mesoplodon*, with most records north of 30°N. There are a number of strandings and sightings considered to be extra-limital in the Canaries, Mediterranean Sea, and from the Gulf of Mexico side of Florida (Martín et al. 2011; Taylor et al. 2008; Bittau et al. 2017). Sowerby's beaked whale status is considered data deficient by the IUCN (Taylor et al. 2008).

As with other members of the genus *Mesoplodon*, Sowerby's beaked whale is thought to occur almost exclusively in deep water beyond the continental shelf edge, in deep ocean troughs and canyons. Hooker and Baird (1999) observed groups of Sowerby's beaked whale in the Gully, a submarine canyon off eastern Canada, on four occasions. Sightings were in water depths of between 550 m and 1,500 m. In Ireland, Sowerby's beaked whales have been recorded in water depths of between 580 m and 2900 m (e.g., O'Cadhla et al. 2004; Wall et al. 2013; (Meade R., O'Brien J. and Berrow S. Beaked Whales (family: Ziphiidae) in Irish Waters: a review of current knowledge and potential threats. submitted).

Sowerby's beaked whale has been reported stranded on the Irish coast on 18 occasions between 1864 and 2016, with ten of these occurring since 2004 (Berrow and Rogan 1997; McGovern et al. 2016). Two live strandings have been recorded, both of which animals subsequently died. All strandings were of single animals with the exception of a stranding in July 2015 when a calf stranded in Co. Kerry, along with what was presumed to be the calf's dead mother

* Correspondence: simon.berrow@gmit.ie

¹Marine and Freshwater Research Centre, Galway-Mayo Institute of Technology, Dublin Road, Galway, Ireland

Full list of author information is available at the end of the article



(O’Connell and Berrow [in press](#)). There have only been seven sightings of at least 25 individual Sowerby’s beaked whales recorded in Irish waters between 2000 and 2014, with estimated group sizes ranging from 1 to 5 individuals (Meade R., O’Brien J. and Berrow S. Beaked Whales (family: Ziphiidae) in Irish Waters: a review of current knowledge and potential threats. submitted).

Methods

Dedicated cetacean sighting surveys were carried out during two dedicated passive acoustic surveys of Ireland’s off-shore waters (Berrow et al. [2018](#)) aboard Ireland’s RV *Celtic Voyager*, which is a 31.4 m multipurpose research vessel operated by the Marine Institute. During daylight hours, a minimum of two primary observers carried out single platform line transect surveys using distance sampling (Buckland et al. [2001](#)), observing out to a distance of approximately 1000-3000 m, depending on sea conditions, from a platform height of 7.5 m above sea-level. Observers scanned with naked eye from dead ahead to 90° to port or starboard depending on which side of the vessel they were positioned. When a sighting was made, the position of the vessel was recorded immediately and the angle and the

distance of the sighting from the vessel (in a straight line from the observer to the sighting) was determined. The angle was recorded via an angle board attached to the vessel between each observer, and distances were estimated using a distance measuring stick (Heinemann [1981](#)). Sightings, species identification, behaviour and group size were confirmed with the aid of 7X50 binoculars. During all transects, the position of the survey vessel was tracked continuously through a GPS receiver fed directly into a laptop. The data recorder logged details into an access database using IFAW Logger 2000™ (IFAW 2000).

Sighting records

Here we report on two sightings of Sowerby’s beaked whales with attendant calves. All individuals reported here were identified as Sowerby’s beaked whale by the long, pointed beak which was raised clear of the water during surfacing. The whales were estimated to be less than 10 m in length, with a small triangular dorsal fin set at least two-thirds along the back. Body colour varied with most individuals’ dark grey in colour with no obvious scratches but at least one individual (presumed to be a male) was much paler

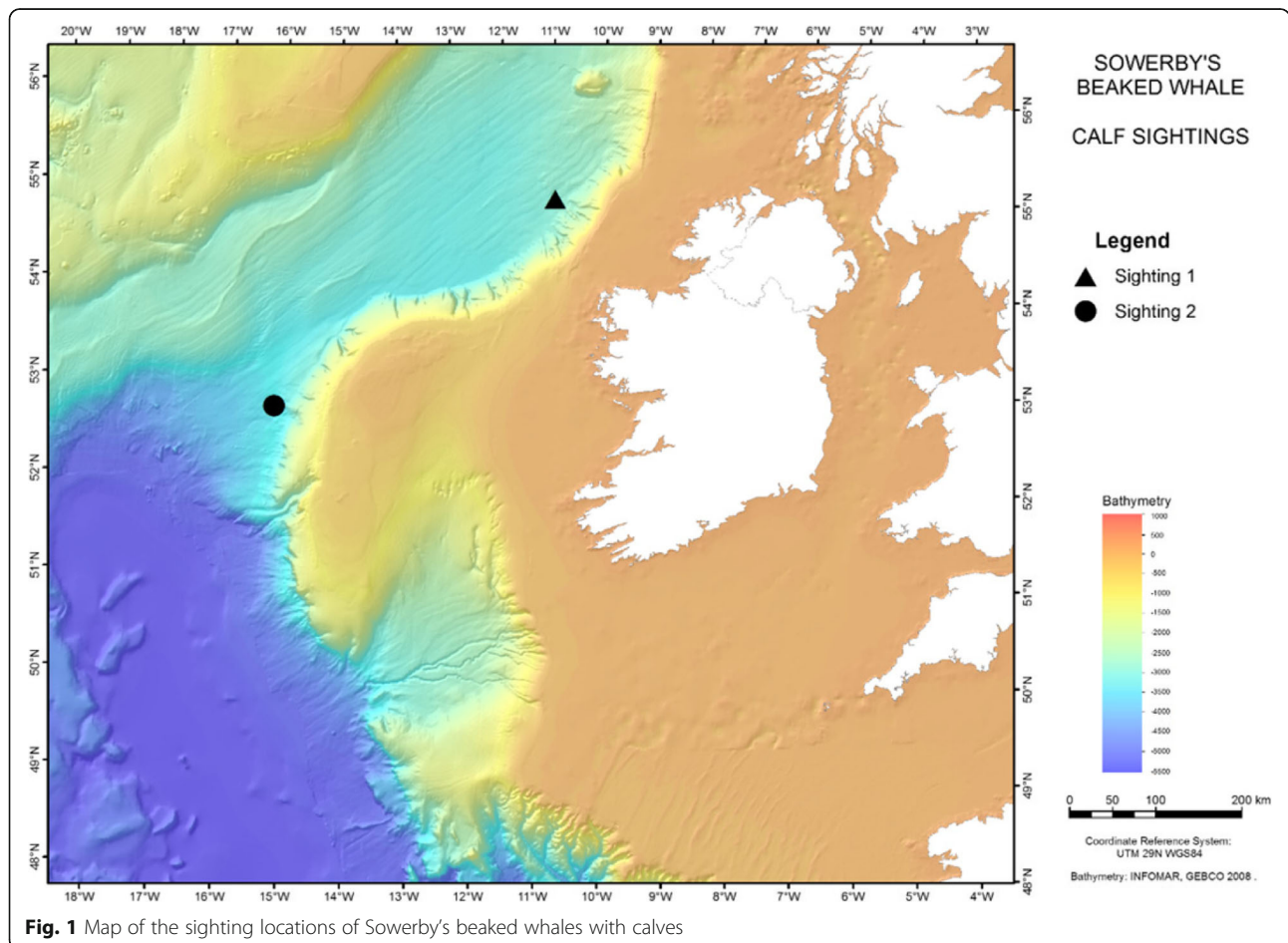


Fig. 1 Map of the sighting locations of Sowerby’s beaked whales with calves

with a darker head, dorsal fin and tailstock. Images were obtained from both sightings to validate species identification.

The first sighting was made on the morning of 9 May 2015 approximately 120 km offshore in a water depth of 2588 m (Table 1; Fig. 1). Three sightings of beaked whales were made over a 51 min period in sea state 0–1. The first sighting was of single adults while the second was a group of three. Images were obtained of these sightings but too distant to assist in species identification but both were recorded as *Mesoplodon* species. The third sighting was of an adult accompanied by a much smaller individual, around one-half the length of the adult, and good images were obtained of the adult to confirm its identification as a Sowerby's beaked whale (Table 1; Fig. 2a and b). No image was obtained of the calf.

The second sighting of Sowerby's beaked whale calves was made on 23 May 2016 approximately 360 km offshore in sea state 4–5 (Fig. 1). A group of five whales was observed and photographed together in a water depth of 3195 m. Two large individuals, estimated at >5–6 m in length, were accompanied by two calves around one-half the length of adults, and also one individual of intermediate length (see Fig. 3a–c). One adult was very pale in colouration

and was presumed to be a male while the second adult was uniform dark and presumed to be a female. No erupted teeth could be seen from photographs of the lower beak (see Fig. 3c), suggesting it was a female. The two calves were also quite pale with one showing large pale patches around its head, eye and beak (see Fig. 3c).

Discussion

These are the first reported sightings of Sowerby's beaked whale calves from the Northeast Atlantic. Hooker and Baird (1999) reported a mixed group of 8–10 individuals on one occasion in July in the Gully off eastern Canada, including two adult-calf pairs and 2–4 adult males. This was similar to our sighting in May 2016 where two calves were present though we only recorded one adult female. Sea conditions were not favourable during our sighting and it was quite possible we didn't observe the whole group, which may have included additional adult females. Sowerby's beaked whales are likely to be more abundant in Irish waters than previously indicated (Kowarski et al. 2018) and more sightings of this species in the future, including with calves are expected.

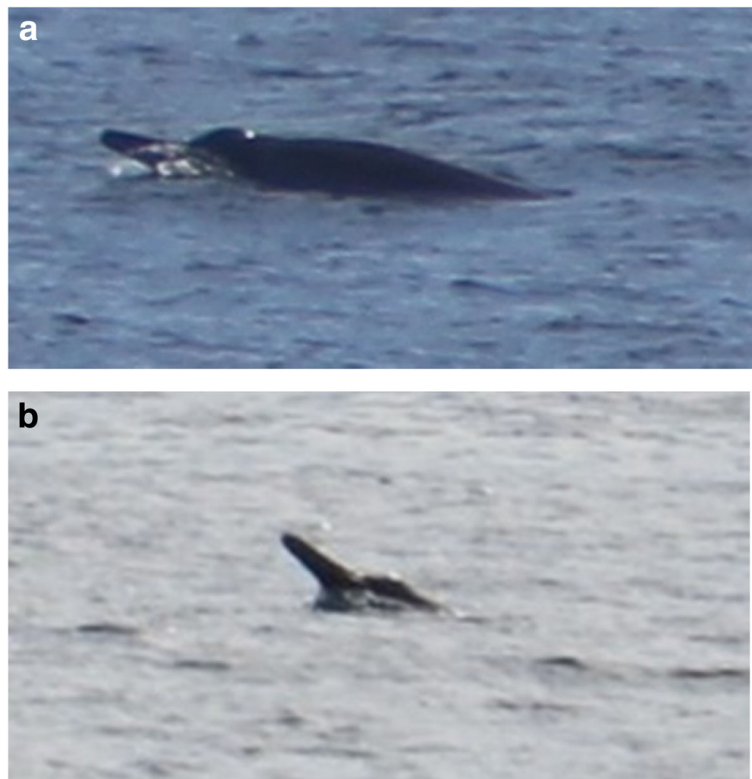


Fig. 2 **a** Photograph of an adult Sowerby's beaked whale recorded with a calf on 9 May 2015 (Photo by S. Berrow, © DCCAE). **b** Photograph of an adult Sowerby's beaked whale recorded with a calf on 9 May 2015 (Photo by E. McKeogh, © DCCAE)

Table 1 Details on two sightings of Sowerby's beaked whales with calves off the western seaboard of Ireland

Date and time (UTC)	Latitude	Longitude	Depth (m)	Seastate (Beaufort)	Group size	Adults	Juveniles	Calves
09/05/2015 09:36	55.2277	-10.9101	2588	1	2	1	0	1
23/05/2016 14:04	52.9084	-15.6619	3195	4	6	3	1	2

Very little is known about the reproductive biology of Ziphiids and especially *Mesoplodon*. Mead (1984) reported a mean length at birth for Sowerby's beaked whale of 2.4 m which is around one-half the length of an average adult female at 5.05 m. Bachara et al. (Bachara W, Laria L, Lopez A. First stranding record of a Sowerby's beaked whale (*Mesoplodon bidens*) in Asturias, Spain. Unpublished report to Cetal Fauna Report WB2016/2; 2016) confirmed length at birth of Sowerby's beaked whale ($n = 338$) as 228 cm. Sowerby's beaked whale calves have stranded on a number of occasions in the Northeast Atlantic throughout the summer and autumn (MacLeod et al. 2004). Sowerby's beaked whales are frequently stranded in Scotland,

including records of small individuals. In early October a male calf of 269 cm total body length stranded in the Firth of Forth Scotland (SAC 2000); in mid-September, a calf live-stranded on the island of St. Kilda off western Scotland (Brownlow and Davison 2013). A Sowerby's beaked whale calf born prematurely (total length: 125 cm) was stranded on the coast of Spain in June (Bachara W, Laria L, Lopez A. First stranding record of a Sowerby's beaked whale (*Mesoplodon bidens*) in Asturias, Spain. Unpublished report to Cetal Fauna Report WB2016/2; 2016). Although birth dates are not known for this species, the sightings reported here were unlikely to be neonates. Both observations were made in May and no neonatal

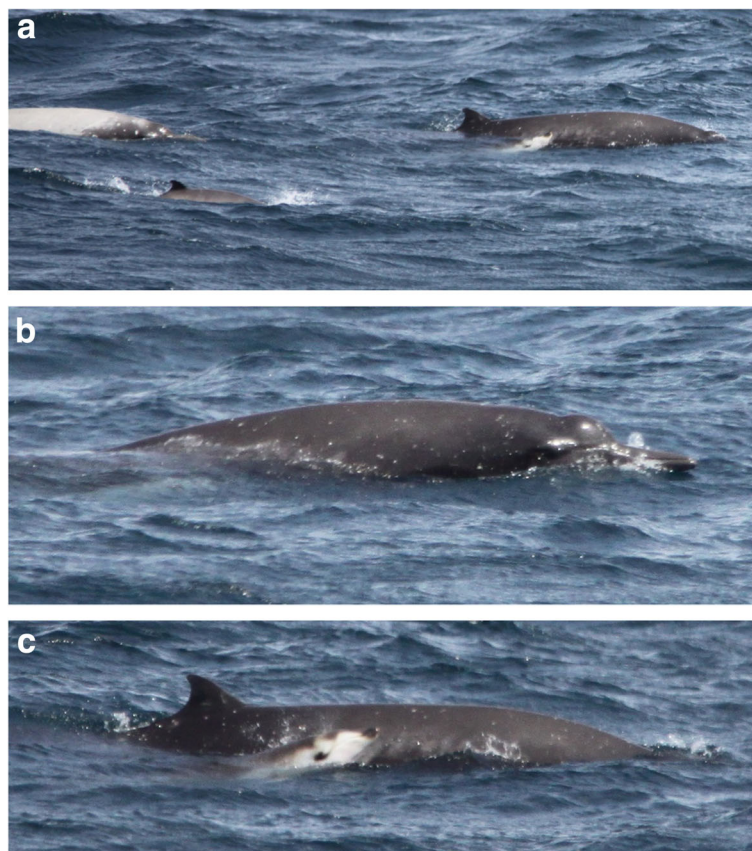


Fig. 3 **a** Photograph of part of a group of five Sowerby's beaked whales recorded on 23 May 2016 and including two calves and a juvenile. A possible adult male is pale in colouration with a presumed female being darker. Note a calf surfacing alongside and parallel to the adults (Photo by S. Berrow, © DCCAE). **b** Photograph of an adult Sowerby's beaked whale on 23 May 2016 (Photo by S. Berrow, © DCCAE). **c** Photograph of an adult Sowerby's beaked whale with accompanying calf on 23 May 2016 (Photo by S. Berrow, © DCCAE)

folds were observed making them more likely up to have been born during the previous summer making them around 6–12 months of age.

The sightings reported here suggest these calves were not neonates but may have been born the previous year, making them more likely around 1 year of age.

These observations provides the first evidence that calving and breeding areas for Sowerby's beaked whale may occur off western Ireland, which should be taken into account during impact assessments for, and management of, offshore maritime activities.

Acknowledgments

We would like to thank the skippers of RV *Celtic Voyager*, Philip Baumb and Colin McBreaty and Aodhán Fitzgerald and Rosemarie Butler of the Marine Institute for logistical support at sea. We would also like to thank all members of the ObSERVE contract management team, drawn from both Departments and with Greg Donovan of the International Whaling Commission, for their input and stewardship during the course of the project.

Funding

These sightings were made during the ObSERVE Acoustic project which was initiated and funded under Ireland's ObSERVE Programme by the Department of Communications, Climate Action and Environment (DCCAE) in partnership with the Department of Culture, Heritage and the Gaeltacht.

Availability of data and materials

The data is owned by the Irish Department of Communications, Climate Action and Environment. Any requests for access to ObSERVE data should be sent to PADAdmin@DCCAE.gov.ie.

Authors' contributions

All authors carried out fieldwork and SB prepared the manuscript. Photos were taken by SB and EMCK. All authors read and approved the final manuscript.

Ethics approval and consent to participate

Not applicable.

Competing interests

The authors declare that they have no competing interests.

Publisher's Note

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Author details

¹Marine and Freshwater Research Centre, Galway-Mayo Institute of Technology, Dublin Road, Galway, Ireland. ²Irish Whale and Dolphin Group, Merchants Quay, Kilrush, Co. Clare, Ireland.

Received: 11 May 2018 Accepted: 13 August 2018

Published online: 19 September 2018

References

- Berrow SD, Rogan E. Cetaceans stranded on the Irish coast, 1901-1995. *Mamm Rev.* 1997;27(1):51–76.
- Berrow SD, O'Brien J, Meade R, Delarue J, Kowarski K, Martin B, Moloney J, Wall D, Gillespie D, Leaper R, Gordon J, Lee A, Porter L. Acoustic surveys for cetaceans in the Irish Atlantic margin: occurrence, distribution and abundance in 2015-2016. *Irish Wildlife Manual*. Department of Communications, Climate Action & Environment and National Parks and Wildlife service (NPWS), Department of Culture, Heritage and the Gaeltacht, Dublin, Ireland; 2018. p. 355.

- Bittau L, Leone M, Gannier A, Gannier A, Manconi R. Two live sightings of Sowerby's beaked whale (*Mesoplodon bidens*) from the western Mediterranean (Tyrrhenian Sea). *J Mar Biol Assoc. (UK)*. 2017:1–7.
- Brownlow A, Davison N. Scottish marine animal stranding scheme annual report 2013, 1 January to 31 December 2013 for Marine Scotland, Scottish Government; 2013. 52pp.
- Bruton T, Cotton D, Enright M. Gulf stream beaked whale *Mesoplodon europaeus* (Gervais). *Ir Nat J.* 1989;23(4):156.
- Buckland ST, Anderson DR, Burnham KP, Laake JL, Borchers DL, Thomas L. Introduction to distance sampling: estimating abundance of biological populations. Oxford: Oxford University Press; 2001.
- Heinemann D. A range finder for pelagic bird censusing. *J Wild Manag.* 1981; 45(2):489–93.
- Hooker SK, Baird RW. Observations of Sowerby's beaked whales, *Mesoplodon bidens*, in the Gully, Nova Scotia. *Can Field Natur.* 1999;113:273–7.
- Kowarski K, Delarue J, Martin B, O'Brien J, Meade R, O'Cadhla O, Berrow S. Signals from the deep: spatial and temporal acoustic occurrence of beaked whales off western Ireland. *PLoS One.* 2018;13(6):e0199431. <https://doi.org/10.1371/journal.pone.0199431>
- MacLeod CD, Perrin WF, Pitman RL, Barlow J, Balance L, D'amico A, Gerrodette T, Joyce G, Mullin KD, Palka DL, Waring GT. Known and inferred distributions of beaked whale species (Ziphiidae: Cetacea). *J Cet Res Man.* 2006;7(3):271–86.
- MacLeod CD, Pierce GJ, Santos MB. Geographic and temporal variations in strandings of beaked whales (Ziphiidae) on the coasts of the UK and the Republic of Ireland from 1800-2002. *J Cet Res and Man.* 2004;6(1):79–86.
- McGovern B, Culloch R, O'Connell M, Berrow S. Temporal and spatial trends in stranding records of cetaceans on the Irish coast, 2002–2014. *J Mar Biol Assoc UK.* 2016. <https://doi.org/10.1017/S0025315416001594>.
- Martín V, Tejedor M, Pérez-Gil M, Dalebout ML, Arbelo M, Fernández A. A Sowerby's beaked whale (*Mesoplodon bidens*) stranded in the Canary Islands: the most southern record in the Eastern North Atlantic. *Aquat Mamm.* 2011; 37(4):512.
- Mead JG. Beaked whales of the genus *Mesoplodon*. In: Ridgway SH, Harrison R, editors. Handbook of marine mammals, Vol. 4: river dolphins and the larger toothed whales. Academic Press; 1989. p. 349–430.
- Mead JG. Survey of reproductive data for the beaked whales (Ziphiidae). *Rep. Int. Whal. Comm.* 1984;(special issue 6):91–6.
- O'Cadhla O, Mackey M, Aguilar de Soto N, Rogan E. and Connolly N. (2004) Cetaceans and seabirds of Ireland's Atlantic margin. Volume II—Cetacean distribution and abundance. Report on research carried out under the Irish Infrastructure Programme (PIP): Rockall Studies Group (RSG) Projects. 82.
- O'Connell M. and Berrow S. (in press) Records from the Irish whale and dolphin group for 2018. *Ir Nat J.*
- SAC. Cetacean strandings investigation Scotland project report to the then Department of the Environment, Transport and the regions reference - CRO179 Project period 12 June 1995–31 March 2000, Report by the Scottish Agricultural College (SAC) Veterinary Science Division, Drummondhill Stratherrick Road Inverness, IV2 4JZ; 2000. p. 37.
- Taylor B.L., Baird R., Barlow J., Dawson S.M., Ford J., Mead J.G., Notarbartolo di Sciara G., Wade P. and Pitman R.L. (2008) *Mesoplodon bidens*. The IUCN Red List of Threatened Species 2008: e.T13241A3424903. <http://dx.doi.org/10.2305/IUCN.UK.2008.RLTS.T13241A3424903.en>. Downloaded on 29 January 2018.
- Wall D., Murray C., O'Brien J., Kavanagh L., Wilson C., Glanville B., Williams D., Enlander I., Ryan C., O'Connor I., McGrath D., Whooley P. and Berrow S. (2013) *Atlas of the distribution and relative abundance of marine mammals in Irish offshore waters: 2005–2011*. Irish Whale and Dolphin Group. 58 pp. ISBN 0-9540552-7-6.

Ready to submit your research? Choose BMC and benefit from:

- fast, convenient online submission
- thorough peer review by experienced researchers in your field
- rapid publication on acceptance
- support for research data, including large and complex data types
- gold Open Access which fosters wider collaboration and increased citations
- maximum visibility for your research: over 100M website views per year

At BMC, research is always in progress.

Learn more biomedcentral.com/submissions

