

Current state of knowledge of the distribution and relative abundance of Risso's Dolphins (*Grampus griseus*) in Irish waters.

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Introduction

Although Risso's dolphins are regularly recorded in Irish waters, relatively little is known of their distribution, ecology or conservation status. Strandings and casual sightings have been reported to the Irish Whale and Dolphin Group from all coasts and in all months of the year (Berrow *et al.* 2010). Sightings were most frequently recorded from the south and west coasts and some evidence of seasonal summer movements has been reported (Wilson and Berrow 2006). Here we present data on Risso's dolphin distribution from offshore line transect surveys conducted by the Irish Whale and Dolphin Group (IWDG) and the Galway-Mayo Institute of Technology (GMIT), casual and effort-related sightings data and photo-identification data collected between 2005 and 2011 and strandings data collected between 2001 and 2011.

Methods

Line Transect Surveys

Offshore sightings were collected as part of the IWDG ferry surveys and ship surveys programmes as per the methods described in Wall *et al.* 2013. Most surveys were conducted by a single surveyor but teams of up to three surveyors were used during IWDG Ferry Surveys.

Non Effort-related Sightings

Casual sightings were collected from members of the public and participating volunteers as part of the IWDG casual sightings and constant effort sightings programmes (Berrow *et al.* 2010). All casual sightings submitted to the IWDG went through a validation process. Around 15% of sighting records were accompanied by images, which are useful in assisting validation. Where species identification could not be confirmed, sightings were downgraded (e.g. unidentified dolphin / unidentified whale / unidentified beaked whale etc.) according to criteria established for the IWDG's cetacean sightings database (IWDG 2013). Effort-related sightings collected by land-based volunteers were used in the preparation of distribution and relative abundance maps but were treated the same as non-effort related data and used solely for mapping species' distribution.

Strandings

Stranded cetaceans were reported to the IWDG from January 2000 to December 2011 from a number of sources but mainly by members of the public and staff of the National Parks and Wildlife Service. A standardized stranding form was produced for recording strandings details. Species identification, length and gender were the basic data required, however additional information on lesions, injuries, presence of fishing net etc. were often also reported. Recorders were requested to supply an image with each record, which was essential to validate species identification. Skin samples were taken in some cases for storage in the Irish Cetacean Genetic Tissue Bank which was housed by the National Museum of Ireland, Natural History (Wall 2006).

Photo-identification

Photo-identification images were opportunistically collected by the IWDG during 29 surveys conducted around the Blasket Islands, Co. Kerry between June 2009 and August 2011. Surveys were conducted in sea state 3 or less from a 6m Rigid Inflatable Boat. 101.5 hours of survey effort were logged, with an average of 3.5 hours per survey, covering 55.6 km per trip.

Results

Sightings and Survey Data

A total of 6,198 hours of offshore line transect survey effort were conducted in Irish and Northern Irish waters, between 2005 and 2011. There were 27 sightings of Risso's dolphins recorded, making them the fifth most frequently recorded dolphin species encountered during the surveys. An additional 242 Risso's dolphin sightings were recorded by the IWDG Casual Sightings and Effort-Related Sightings schemes in the same time period.

Risso's dolphins were recorded on a regular but infrequent basis in inshore waters around the entire Irish coast. Their distribution was centered over the Irish Shelf, with highest relative abundances recorded off the southwest and southeast coasts (figure 1). Sightings data indicated that Risso's dolphins in Irish waters had a largely coastal distribution and regularly occurred at inshore locations. No sightings were recorded in waters deeper than 1000m. They were largely absent from Irish Shelf waters from December to March (figure 2).

Risso's dolphins were recorded in Irish Waters throughout the year, with sightings peaking during spring and early summer. The presence of young calves in some groups indicated that calving occurred in Irish waters.

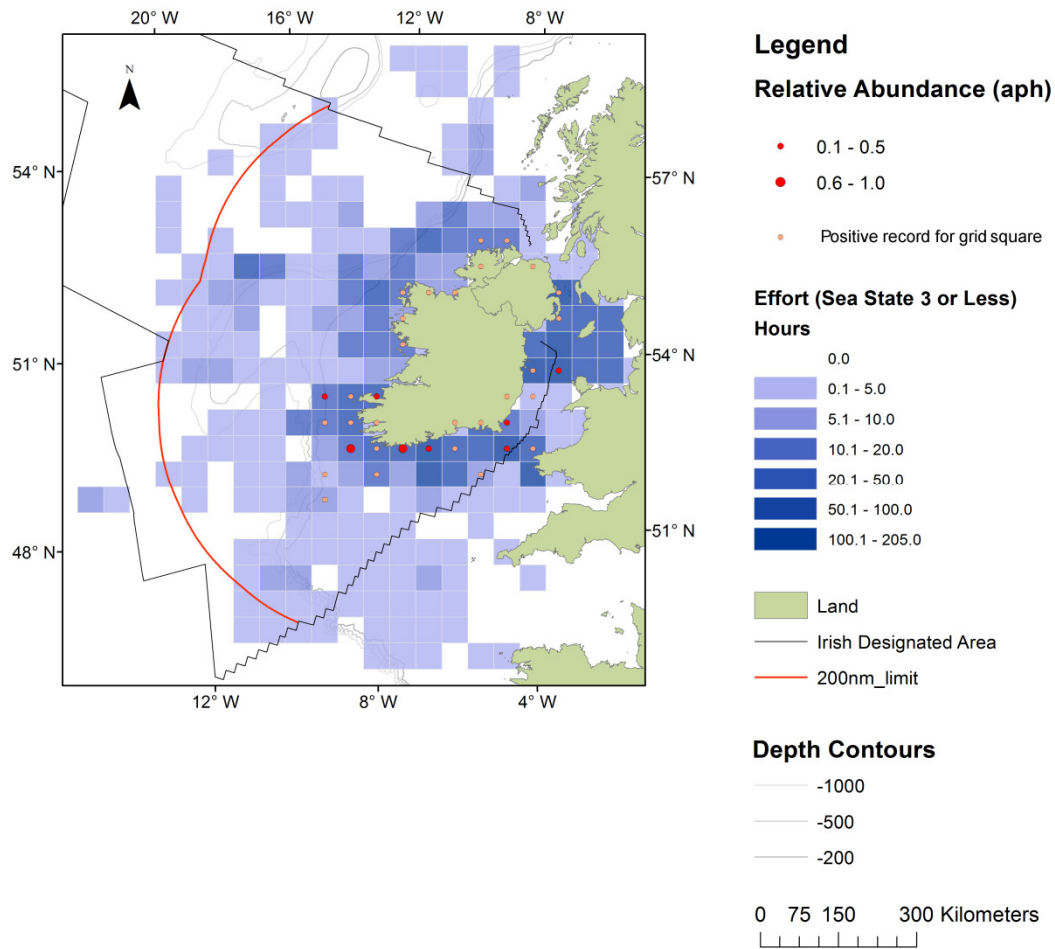


Figure 1 Distribution and relative abundance of Risso's Dolphins within the Irish EEZ 2005-2011 (Wall *et al.* 2013)

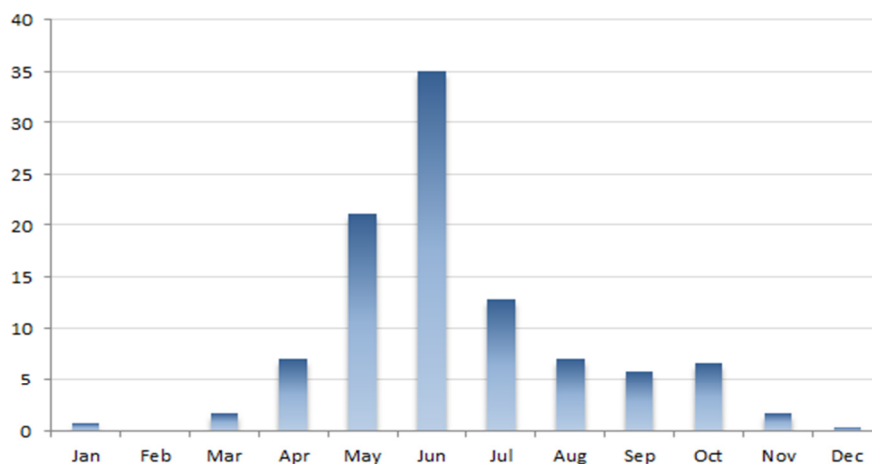


Figure 2 Monthly distribution of 242 Risso's dolphin non-effort related sightings recorded by IWDG between 2005 and 2011 (IWDG 2013)

Strandings

36 Risso's dolphin strandings were recorded by IWDG from 2005-2011. Strandings peaked in the late summer and autumn (figure 3) and occurred on the south east, south, west and north coasts, with only a single stranding recorded on the east coast (figure 4).

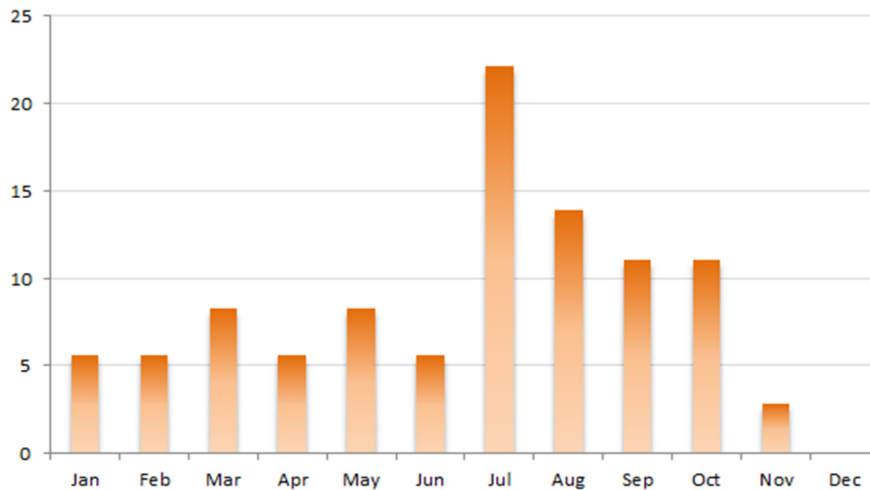


Figure 3 Monthly distribution of 36 Risso's dolphin strandings recorded by IWDG between 2000 and 2011 (IWDG 2013)

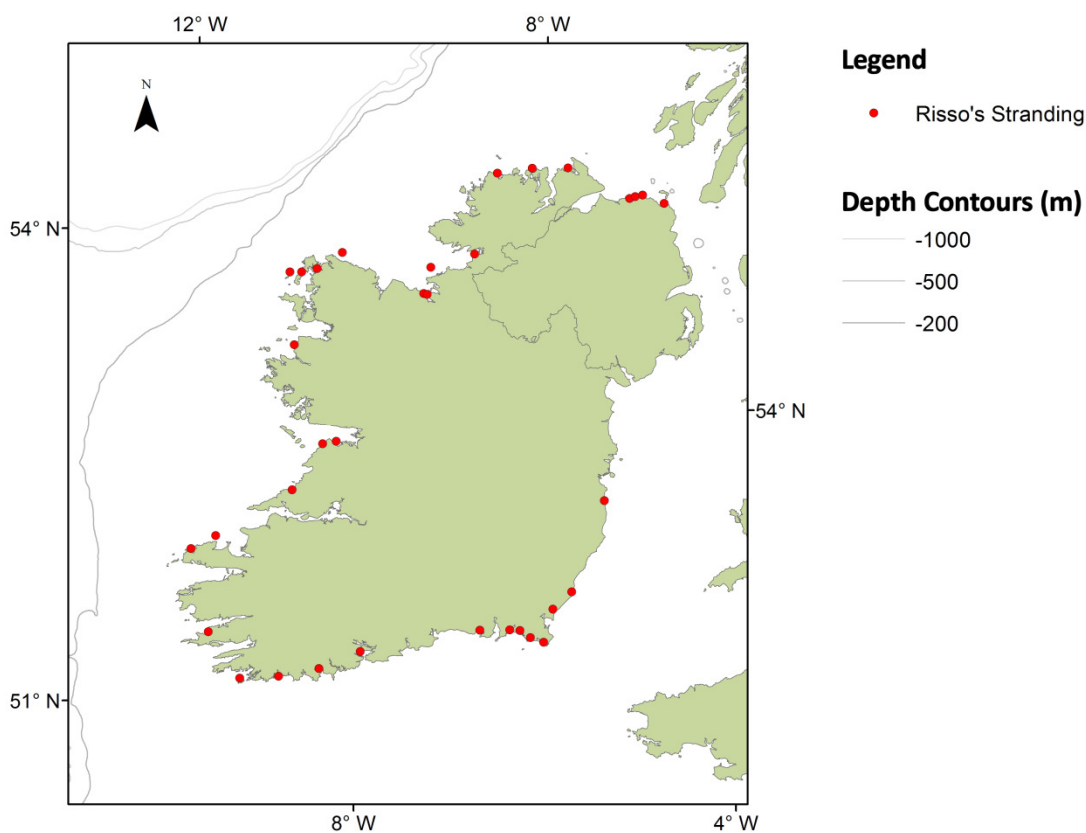


Figure 4 Distribution of 36 Risso's dolphin strandings recorded by IWDG between 2000 and 2011 (IWDG 2013)

Risso's dolphins were recorded on 11 of 29 (38%) surveys around the Blasket Islands, Co Kerry, located off the southwest coast of Ireland (figure 5). Sightings were primarily recorded between Great Blasket Island and Inisvikallane, where a strong current runs between the two islands. Of the 33 animals with well-marked dorsal fins that are stored on the IWDG Photo-ID database (IWDG 2013), 31 were photographed on surveys around the Blasket Islands. There was evidence of site fidelity by Risso's Dolphins in this area, with one intra-annual and two inter-annual re-sightings. The longest period between re-sightings was 969 days. All re-sightings occurred within the Blasket Islands, with a maximum distance between re-sightings of 10.7 km.

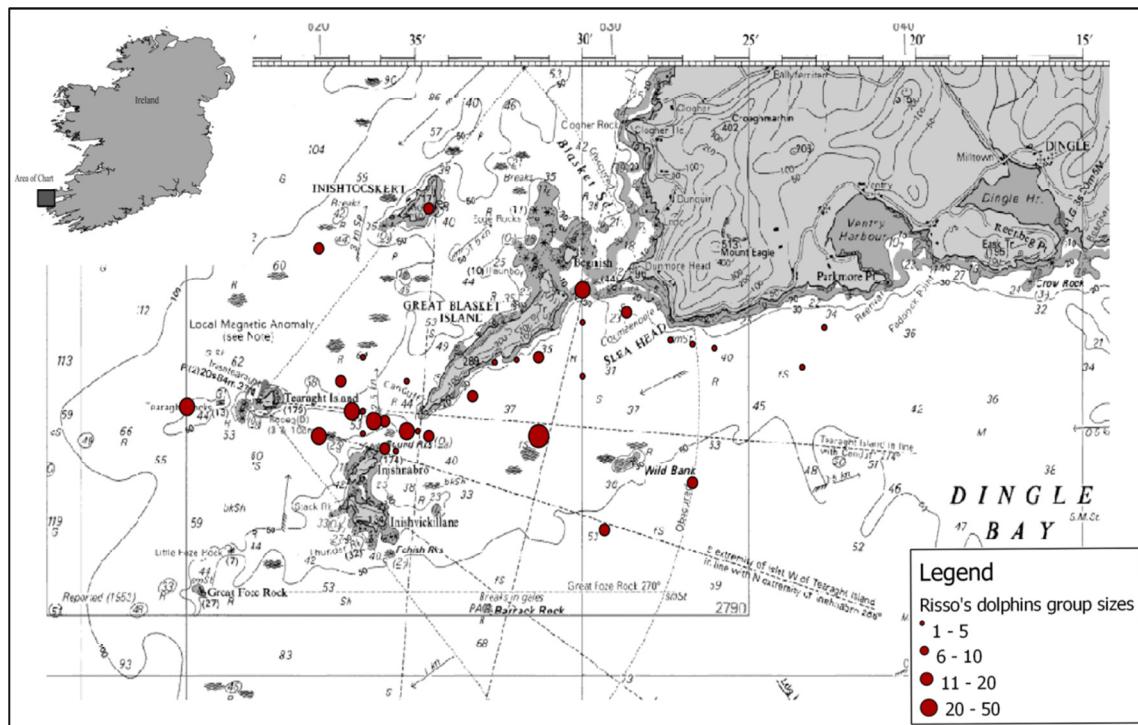


Figure 5 Distribution and group size of Risso's Dolphin sightings recorded by IWDG boat based surveys of Blasket Islands 2009 - 2011

Discussion

Risso's dolphins in Irish waters occurred primarily in continental shelf and inshore habitats. There was no evidence to suggest that they occurred in deep water habitats along the shelf slopes. The distribution of Risso's dolphins found in this study was in stark contrast to the reported preference of this species for deep-water and slope habitats elsewhere (Shirihai and Jarrett, 2006). Why Risso's in Irish waters exhibit a preference for shelf and inshore waters is not known, however other concentrations of Risso's dolphins have been reported from adjacent shelf waters in the central Irish Sea (Baines and Evans 2012) and the northwest of Scotland (Weir *et al.* 2001).

Although the distribution of Risso's dolphins in the Northeast Atlantic extends north to the Faroe Islands, and all Irish waters lie well within this range, their relative abundance off the north and northwest Irish coasts was low. The reasons for this are not understood, however Wall *et al.* (2006) noted that the relative abundance of all dolphin species in Irish Shelf waters to the north and northwest of Ireland were significantly lower than elsewhere in the Irish EEZ.

Sightings of Risso's dolphins are regularly reported from inshore waters and islands of the southeast and southwest coasts. This may indicate a degree of site fidelity in these areas. Photo-identification data from the Blasket Islands, yielded two inter-annual matches between individuals, with one re-sighting occurring over two years after the initial record. From 2003 to 2006 Risso's dolphins were regularly recorded off the Dublin and Wicklow coast of the Irish Sea between Dún Laoghaire and Greystones (figure 6). Both before and after this period sighting rates were low for this stretch of coastline indicating that the local abundance of this species may vary temporally and over extended periods. It is not know what caused the periodic increase in Risso's dolphins sightings on the Irish east coast during this period or how often such fluctuations in the local abundance of Risso's dolphins may occur.

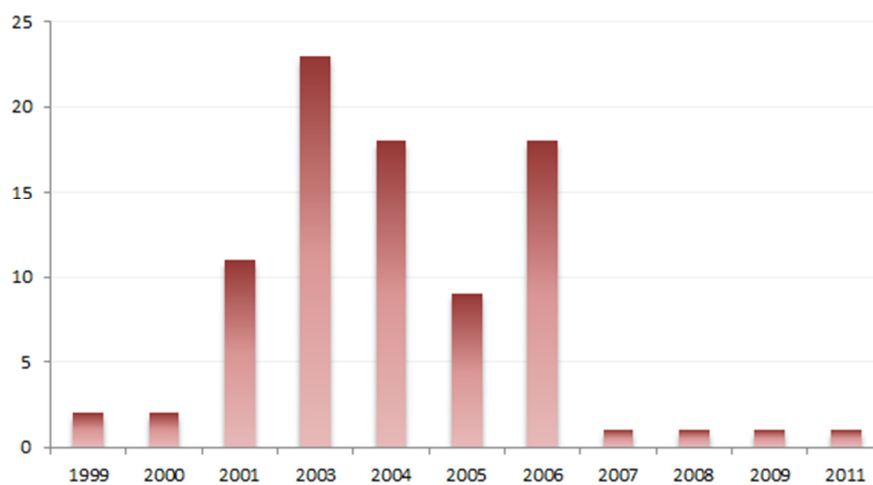


Figure 6 Annual numbers of sightings records of Risso's dolphins recorded from the Dublin and Wicklow coasts by IWDG between 1999 and 2011 (IWDG 2013)

Strandings data indicate that this species occurs year-round in Irish waters, with the sightings data suggesting that Risso's dolphins may move offshore during the autumn and winter, when inshore sightings decline. The low number of strandings over the past 11 years, coupled with regular sightings records indicates that Risso's dolphins are regularly occurring but not abundant in Irish waters. Sightings of young calves off the southeast coast indicate that Risso's dolphins also calve in Irish waters.

Conclusions

- Risso's dolphins are a regular occurring, consistent and important member of Ireland's cetacean fauna. Their distribution is patchy with low animal abundance.
- The lack of sightings in deep waters beyond the continental shelf is inconsistent with the described habitat preference of Risso's dolphins in other parts of their range, however similar preference for shallower shelf waters has been described from adjacent UK waters.

- Both intra-annual and inter-annual photo-identification matches indicate a degree of site fidelity in some areas. Further photo-identification effort is required in Irish waters, especially off the southeast and southwest coasts.
- Genetic studies of Risso's dolphins in Irish and UK waters may help clarify their population structure.
- There is no information available on the diet of Risso's dolphins in Ireland, nor what their prey species in Irish Shelf waters is. Dietary analysis and radio isotope studies would help elucidate prey species of importance to Risso's dolphins in continental shelf habitats.
- A targeted line-transect survey of the southeast and southwest coasts during late summer and autumn is most likely to enable a robust estimate of Risso's dolphin local population abundance to be made.

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