

Winter distribution of Bottle-nosed Dolphins (*Tursiops truncatus* (Montagu)) in the inner Shannon Estuary

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In order to record the distribution of Bottle-nosed Dolphins Tursiops truncatus (Montagu 1821) in the inner part of the Shannon Estuary, dedicated boat transects were carried out during the winter (November to March). Bottle-nosed Dolphins were recorded on seven of the ten transects with six of these sightings between Scatterry Island and the Tarbert Races and with only one up-river, off Foynes Island. Eighteen individual dolphins were recognized using photo-identification all of which had been previously recorded in the estuary. The results confirm that Bottle-nosed Dolphins do occur regularly in the Shannon Estuary during winter months, with sighting frequency comparable to transects carried out during the summer in other parts of the estuary

Keywords: Bottle-nosed Dolphin, Shannon Estuary, transects, winter, photo-identification

INTRODUCTION

The Shannon Estuary is a candidate Special Area of Conservation (cSAC) for Bottle-nosed Dolphins (*Tursiops truncatus* (Montagu 1821)) and covers an area from Loop Head, Co. Clare and Kerry Head, Co. Kerry to the west, and upriver as far as Killaloe and Ennis in Co. Clare, including the Fergus Estuary and the catchments of the Rivers Cashen, Mulkear and Maigue to the east (NPWS 2000). Since 1993 there have been two published studies on the distribution and relative abundance of Bottle-nosed Dolphins in the Shannon Estuary (Berrow *et al.* 1996, Ingram and Rogan 2002) and a number of unpublished reports (Ingram 2000, Duigud 2003, Ingram and Rogan 2003, Englund *et al.* 2007). These studies involved carrying out dedicated boat transects in the outer (defined as west of Kilcredaun Point) and middle (defined as between Kilcredaun Point and Tarbert) parts of the estuary. There have also been casual reports of Bottle-nosed Dolphins as far up river as Limerick City (Woulfe 2003) and short-term monitoring studies have reported the dolphins off Foynes (Berrow 2001,

O'Brien 2004) and Aughinish Island, Co. Limerick (Berrow *et al.* 2002).

None of the dedicated boat-transect studies attempted to survey Bottle-nosed Dolphins in the inner (defined as east of Tarbert) section of the Shannon Estuary, and prior to this study there had been only nine dedicated transects carried out between November and March in any part of the estuary. Thus there were very few data on the distribution and relative abundance of Bottle-nosed Dolphins within the Shannon Estuary cSAC during the winter. Ingram (2000) found a marked increase in dolphin abundance in the outer and middle parts of the estuary during the months April to October. He suggested that "it may also be possible that there are indeed fewer animals using the estuary during March and April but these animals are utilising the upriver parts of the study area" (Ingram 2000 *op.cit.*).

The objectives of this small study were to increase our knowledge of the distribution and relative abundance of Bottle-nosed Dolphins in the Shannon Estuary during the winter period and to carry out transects in a previously un-surveyed area in the inner section of the Shannon Estuary cSAC.

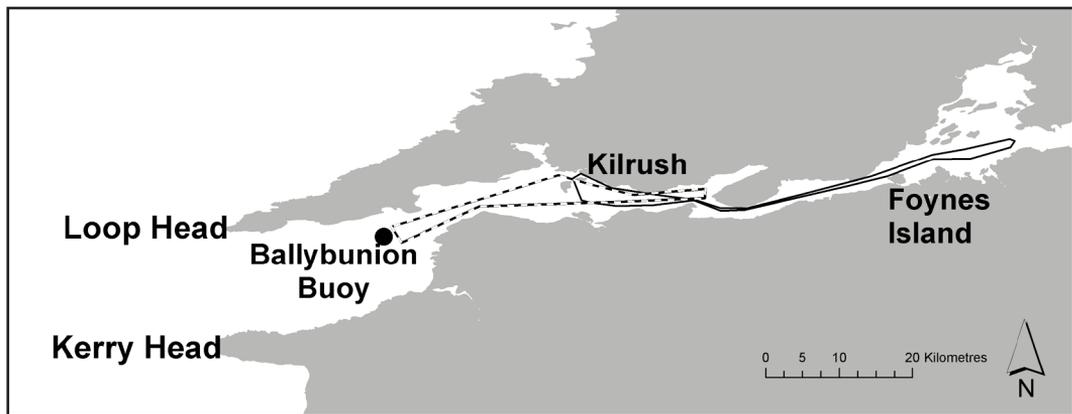


Figure 1. Map of the Shannon Estuary showing: Dashed line - route of transects from previous studies; solid line - transect route taken during the present study.

METHODS

Dedicated boat transects were carried out from Kilrush Creek Marina, Co. Clare on ten occasions between 4 November 2002 and 9 March 2005 (Table 1). The area between Scatterry Island to the mouth of the Fergus Estuary was surveyed (Fig. 1). A 5.4 m Lencraft Rigid Inflatable Boat (RIB) fitted with an 80 hp Yamaha engine was used for each transect. Mean velocity during each transect was maintained at 20 km hr⁻¹ which resulted in the 90 km long transect being surveyed in around 4-5 hours. Transects were only carried out in sea-state 2 or less. During each transect two observers kept a constant lookout for dolphins. One observer (the coxswain) searched a 90° sector ahead of the vessel, while the second observer searched a 90°

arc alternating on either side of the vessel every 1-2 minutes. The vessel's route was continuously logged using a Garmin© GPS.

If dolphins were observed, the position at the start and end of the encounter was recorded with a waypoint on the GPS. The group size and behaviour of the dolphins (following Shane 1990) was recorded and photo-identification of each individual dolphin was attempted. Images were taken with a Canon EOS 50 SLR camera and 70-300 mm or 200-500 mm auto-focus telephoto lenses. Dolphin images were inspected for any marks (notches, nicks or scratches), which would match them to dolphins previously recorded and archived in the Shannon Dolphin and Wildlife Foundation (SDWF) Photo-ID catalogue (see www.shannondolphins.ie/research/photo-id).

In addition, winter sighting records of Bottle-nosed Dolphins in the Shannon Estuary between Scatterry Island and Shannon Airport were collated. These records were obtained from previous unpublished studies or from sightings reported by local mariners to the SDWF. Staff operating the Shannon Ferry between Killimer and Tarbert have been collecting sightings of Bottle-nosed Dolphins since 1993. In the winter months from October to March, one ferry carries out 26 sailings per day. Ferry sightings data have been presented as sighting days, which is defined as the number of days each month when a sighting of Bottle-nosed Dolphins was made. A sighting might be one or more dolphins and there may be multiple sightings in a single day. No species of cetacean other than Bottle-nosed

Table 1: Winter boat transects carried out between November and March from 2002 to 2005.

Date	Sea-state	Time left port	Dolphins recorded	Behaviour
4 Nov 2002	1	10:30	None	-
1 Dec 2002	1	11:30	None	-
4 Jan 2003	0	12:00	15 (2 calves)	Travelling
12 Jan 2003	2	12:30	6-8 (1 calf)	Socializing
23 Mar 2003	1	12:30	12 (1 calf)	Travelling
1 Dec 2003	0	12:00	12-15	Socializing
24 Feb 2004	1	11:30	5-6	Foraging
26 Nov 2004	0	12:30	13 (2 calves)	Foraging
26 Jan 2005	1	11:30	None	-
9 Mar 2005	1/2	10:30	6	Foraging

Dolphins have been observed alive in the estuary east of Carrigaholt, so even if observers were not completely familiar with cetaceans we can be reasonably confident they were Bottle-nosed Dolphins.

RESULTS

Single groups of Bottle-nosed Dolphins were observed on 7 out of 10 transects. Six of these sightings were between Scattery Island and the Tarbert Races with only one upriver, off Foynes Island (Fig. 1). Group size varied from 5 to 15 dolphins. Calves (small dolphins with neonatal folds still present) were observed on four occasions, with a maximum of two calves observed on two occasions. Three behaviour types were recorded; travelling, socializing and foraging (Table 1). Photographs of dolphins were obtained during four of the seven dolphin encounters recorded during this study. From this, images of 18 individually recognizable dolphins were extracted (Table 3) and it was found that all dolphins had been previously recorded in the estuary. Two dolphins were recorded on two transects each, the remainder being recorded on one transect.

There was also a total of 11 sighting records of Bottle-nosed Dolphins from casual observers and monitoring studies, in the study area in the winter months (between November and March) from 2001 to 2005 (Table 2). Six of these sightings were between Scattery Island and Tarbert, with the other five in the stretch of water

between Bolands Buoy and Foynes Island in the inner estuary. There were no reports of Bottle-nosed Dolphins up-river of Foynes Island.

Analysis of a larger data set of 213 sightings of dolphins that were made from the Shannon Ferry in the winter months between 1994 and 2005 (excluding 1995) is summarized in Figure 2. From this data it can be seen that sightings have been made in every winter month, with the mean (\pm SE) number of days with sightings declining from November (3.64 ± 1.07) to a minimum in January (1.91 ± 1.02) before increasing again through to March (8.64 ± 1.71).

DISCUSSION

This short study doubles the number of dedicated boat transects carried out in the Shannon Estuary during the winter, defined here as from November to March. It also provides new data on the distribution of Bottle-nosed Dolphins upriver of Tarbert, Co. Kerry, a previously unsurveyed part of the estuary.

The results confirm that Bottle-nosed Dolphins do occur regularly in the Shannon Estuary during winter months, especially between Scattery Island and Tarbert Races. The sighting frequency of 70 per cent of transects compares favourably with 61 per cent recorded during May to September by Berrow *et al.* (1996) in the outer estuary and 89 per cent, as calculated from data presented in Ingram and Rogan (2003), from the middle and outer estuary. The maximum encounter rate recorded during the

Table 2: Casual sightings of Bottle-nosed Dolphins in the Shannon Estuary between November and March from 2001 to 2005.

Date	Group size	Behaviour	Time	Location	Reference
29 Jan 2001	-	Travelling	-	Foynes - Rinealon Point	Berrow (2001)
2 Feb 2001	-	Travelling	-	Foynes - Rinealon Point	Berrow (2001)
16 Nov 2003	2	Travelling	16:05	Off Tarbert Lighthouse	Berrow and O'Brien (2003)
1 Dec 2003	10-15	Socializing	10:15	Ardmore Point	Berrow and O'Brien (2003)
31 Jan 2004	8-10	Travelling west	-	East of Rinealon Point	O'Brien (2004)
14 Feb 2004	2	Travelling east	17:15	Loughill, Co. Limerick	Fred Jones
25 Feb 2004	2	Milling	-	Between Tarbert and Killimer	O'Brien (2004)
4 Mar 2004	4	Milling/Foraging	-	Clonderlaw Bay	Brian Holmes
3 Nov 2004	4-6	Foraging	PM	Moneypoint	Sean O'Neill
14 Nov 2004	10-20	Socializing	12:30	Scattery Island	Gerard Griffin
24 Jan 2005	10-12	Milling	-	Bolands Rock to Labasheeda	Darren McGibney

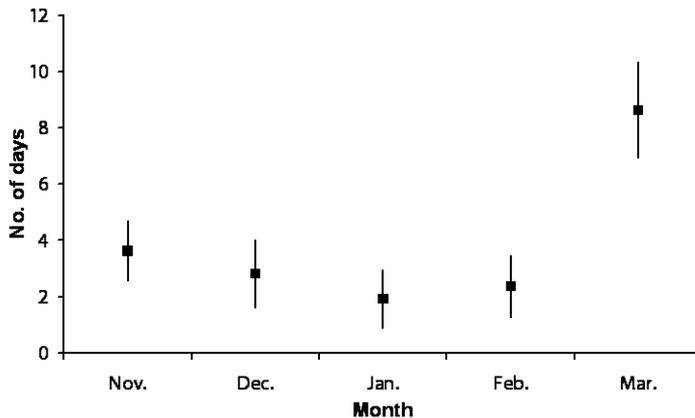


Figure 2: Mean number of days per month with sightings of Bottle-nosed Dolphins from the Shannon Ferry from 1994 to 2005 (not including 1995).

present study (0.17 dolphins km^{-1} travelled) was low compared to the maximum encounter rate of 0.8 km^{-1} travelled during August 2003, as calculated from data presented in Ingram and Rogan (2003). Dolphins were recorded from the Shannon Ferry through the winter but the sighting rate decreased to a minimum in January before increasing through to March. This may be influenced by increased sea-states during this period and fewer daylight hours. The sighting rate in the inner estuary was very low with only one encounter in March 2003. This demonstrates that dolphins occasionally travel upriver during the winter, but this area does not appear to be an important habitat during this period. However, it is likely that dolphins could have been easily overlooked to the east of Foynes and in the mouth of the Fergus Estuary as the estuary widens greatly at this location with many

Table 3. Individual dolphins photo-identified during boat transects.

Date	Group size	SDWF Catalogue Number
4 Jan 2003	15	50, 53, 90, 93, 99, 106, 114, 84, 121, 131, 132
12 Jan 2003	6-8	None
23 Mar 2003	12	62, 92, 84
1 Dec 2003	12-15	None
24 Feb 2004	5-6	None
26 Nov 2004	13	8, 28, 34, 46, 47, 83
9 Mar 2005	6	28

islands which could obscure the visibility of dolphins to boat surveyors.

Photo-identification has shown that all the dolphins identified had been recorded previously, three on over 30 occasions since 1993. This indicates that the dolphins present during the winter are the same dolphins recorded in the estuary during the summer.

This study has shown that dolphins are still present throughout the winter in the middle part of the estuary and occasionally occur in the inner estuary. However, it is likely that the presence of dolphins in the inner estuary may have been underestimated. It is recommended to continue transects through the winter and summer in the inner Shannon Estuary to monitor which individuals are present. It is also intended to deploy passive acoustic monitoring at a number of key sites. Monitoring sites between the Tarbert Races and Foynes Island would be especially useful to increase our knowledge of the movements of Bottle-nosed Dolphins between the middle and the inner Shannon Estuary.

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