

Shannon dolphin tour boat monitoring report – 2003

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Introduction

The Shannon estuary is a candidate SAC for bottlenose dolphins *Tursiops truncatus*. Commercial dolphin-watching is carried out within the estuary and consent is given by National Parks and Wildlife Service to those operators wishing to dolphin-watch, under the Notifiable Actions providing operator's adhere to certain conditions. These conditions include "providing monitoring data for each trip in the prescribed form as outlined in the data sheet Tour Boat Monitoring Protocol 2000". The Shannon Dolphin and Wildlife Foundation (SDWF) were contracted by National Parks and Wildlife Service to co-ordinate this monitoring during the 2003 season.

Methodology

Operators are required to fill out a log-sheet for each dolphin-watching trip they carry out. Each log-sheet prompts for information on trip length, time to locate dolphins, number of groups and dolphins observed, presence and estimated number of calves, location of dolphins and time for which each group was watched. Photo-identification is carried out on a sample of trips to determine which dolphins are being watched from tour boats.

Of the 454 log-sheets received, 31 (6.8%) log-sheets had some data missing (28 on trips from Kilrush and 3 from Carrigaholt). The large number of incomplete datasheets last year was due to difficulties defining a group of dolphins. Prior to the 2003 season a working definition was developed (see Appendix I) and circulated to operators. This seems to have helped completion of monitoring forms.

Results

Eight monitoring indices were collected during 2002 and are presented below.

1. *Number of operators and trips*

Four companies/individuals operating up to seven dolphin-watching vessels were given consent by National Parks and Wildlife Service to dolphin-watch during 2002. Of these, two companies only used three vessels during the season and these are listed in Annex II. One individual operating from Doon near Ballybunion (Robert Stack) carried out about 10-20 trips but unfortunately all his records were lost when his vessel sank on its moorings in September 2003.

During the 2003 season trip records were received for a total of 454 trips. Of these 248 (54.6%) departed from Carrigaholt and 206 (45.5%) departed from Kilrush in Co. Clare (see Table 1).

More trips were carried out in April and May during 2003 (53) compared to 2002 (16). As with previous seasons, two-thirds of trips (68.9%) were carried out during July and August. The total reported number of trips were 14 (3%) less than in 2002 although Dolphinwatch in Carrigaholt increased their trips numbers by 13%.

Table 1. Number of dolphin-watching trips carried out in the Shannon estuary during 2003 season. Around 20 trips were carried out from Doon, Co Kerry but all trip records were lost due to the dolphin-watching boat sinking in September. (These trips are not included).

Month	Port		Total (%)
	Carrigaholt	Kilrush	
April	17	13	30 (6.6%)
May	10	13	23 (5.1%)
June	23	26	49 (10.8%)
July	76	56	132 (29.1%)
August	99	82	181 (39.9%)
September	15	12	27 (5.9%)
October	8	4	12 (2.6%)
TOTAL	248	206	454

2. Length of trip

The mean length of each dolphin-watching trip was very similar between the two ports, Kilrush and Carrigaholt during 2003 and 7% shorter than 2002. This suggests dolphins were easier to find during 2003, which is influenced by favourable weather conditions and the operators experience in finding dolphins as well as the dolphin's relative abundance and distribution.

Table 2. Mean length (minutes) of dolphin-watching trips from 2000 – 2003.

Port	Year			
	2000	2001	2002	2003
Carrigaholt	119.6	124.9	123.6	117.8
Kilrush	133.1	129.7	125.6	115.2

3. *Time to locate dolphins*

Dolphins were located on 98% of trips during 2003. Only 6 trips from Kilrush and 3 trips from Carrigaholt failed to see dolphins. As in previous years, dolphins were located more quickly from Carrigaholt (mean 25 minutes) than from Kilrush (mean 45 minutes), which was 5-9 minutes less than in 2002 but similar to 2001.

Table 3. Mean time to locate dolphins (minutes) from different ports in the Shannon estuary during 2003 season. Only those trips which located dolphins are included.

Month	Port	
	Carrigaholt	Kilrush
April	40.3	50.3
May	20.7	41.9
June	21.0	39.5
July	19.7	42.4
August	8.94	37.0
September	34.4	53.0
October	28.4	53.0
Mean	24.8	45.3

4. *Location of dolphin groups*

The tour boat operating from Carrigaholt located most dolphins in areas 1 (56%) and 3 (35%) (Table 4). This is different from 2002 when more dolphins were located in Zone 2 but consistent with 2001. Tour boats from Kilrush tended to carry out most dolphin-watching in areas 3 (34.5%), 4 (18.5%) and 6 (17.9%), which was consistent with 2002.

Also consistent with 2001, most trips from both ports located dolphins in Zone 3. Any studies to assess the impact of dolphin-watching on the behaviour of dolphins should target dolphins using this zone.

**Table 4. Zones in which tour boats watched dolphins during 2003
(see Appendix IV for map).**

Zone	Carrigaholt	Kilrush	Total
	No (%)	No (%)	No (%)
1	138 (56%)	4 (2%)	142 (58%)
2	19 (8%)	1 (1%)	20 (9%)
3	86 (35%)	71 (34.5%)	157(70%)
4	1 (1%)	38 (18.5%)	38 (18.5%)
5	0	19 (9.2%)	20 (10.2%)
6	0	37 (17.9%)	37 (17.9%)
7	0	20 (9.7%)	20 (10.2%)

5. *Time on dolphins*

The total time on dolphins for all vessels during 2003 was calculated as 13,498 minutes or 225 hours (Table 5). This is a decline of 3% on 2002. This is of interest, as the figures for 2002 were considered inaccurate due to the large proportion of incomplete log-sheets. The data from 2003 is considered accurate and yet there was a decline in the total time on dolphins. The mean time on dolphins per trip was 29.7 minutes, although up to 2.5 groups of dolphins may be watched per trip. Thus tour boats do not necessarily watch dolphins for the full time allowed under the Code of Conduct.

6. *Number of dolphins and groups*

As in previous seasons, the tour boat from Carrigaholt tended to watch more groups of dolphins on each trip (Table 6). The number seen per trip from Carrigaholt was higher than 2002 but consistent with 2001 and continues to be around one group per trip from Kilrush.

The number of dolphins watched per trip was higher from both ports when compared to 2002. This is of interest as the mean numbers in 2002 were considerably higher than 2001. Once again mean group size in September and October was much higher from both ports than earlier in the season with up to 45 dolphins seen from Carrigaholt in October. This probably reflects a change in the dolphin's social behaviour towards the end of the calving period.

Table 5. Total time on dolphins (minutes) from different parts in the Shannon estuary during 2003 season. (different groups observed within a trip are indicated).

Month	Carrigaholt							Kilrush				
	G1	G2	G3	G4	G5	G6	Total	G1	G2	G3	Total	Total
April	313	91	19	-	-	-	423	291	72	-	363	786
May	131	82	34	26	-	-	273	360	-	-	360	633
June	341	240	125	34	2	-	742	745	150	14	909	1651
July	933	762	276	72	44	-	2087	1422	183	-	1605	3692
August	1727	822	534	56	3	6	3148	2265	137	30	2432	5490
September	251	145	66	10	-	-	412	309	30	-	339	751
October	90	54	53	39	19	-	255	90	-	-	90	264
Total												
-minutes	3786	2194	1107	237	68	6	7400	5482	572	44	6098	13498
- hours	63.1	36.6	18.5	3.95	1.13	0.1	123.3	91.3	9.5	0.44	101.6	224.9

Table 6. Mean number of dolphins and dolphin groups encountered from different ports in the Shannon estuary during 2003 season.

Month	Carrigaholt		Kilrush	
	Groups	Dolphins	Groups	Dolphins
April	1.58	17.1	1.15	9.7
May	2.9	25.0	1.0	2.9
June	2.5	21.7	1.26	10.6
July	2.4	21.4	1.08	8.3
August	2.12	21.0	1.03	11.82
September	2.86	32.0	1.25	15.75
October	3.38	45.1	1.0	19.25
MEAN	2.53	26.1	1.11	11.18

7. *Number of groups with calves*

Of the 591 groups watched from Carrigaholt, 469 (79.4%) had calves present. From Kilrush, of the 226 groups watched, 83 (36.3%) had calves present, again showing that breeding groups are subjected to dolphin-watching in the Shannon estuary, especially from Carrigaholt.

8. *Individual dolphins watched from tour boats*

The individual dolphins watched from tour boats was recorded using photo-identification. During 2003, 37 trips were accompanied from Kilrush and 20 from Carrigaholt, making 57 or 12% of all trips carried out during 2003. This was above the target of 10% for the season. Dolphins were observed on 56 of these trips and photographs were taken on all trips with dolphins. A total of 86 individual dolphins were identified and of these 80 (93%) had been previously recorded and 6 (7%) were previously unrecorded.

Of those dolphins identified from tour boats during 2003, around one-third have also been recorded during the previous three years. This suggests that the same dolphins are watched each year from tour boats.

Table 7. Number of identifiable dolphins recorded from tour boats, 1999-2002.

Year	No. of trips	No of identified dolphins	Number (%) of dolphins recorded from tour boats in previous years			
			1999	2000	2001	2002
1999	11	22	-	-	-	
2000	25	35	13 (37%)	-	-	
2001	27	33	10 (30%)	19 (58%)		
2002	31	42	11 (31%)	18 (50%)	24 (67%)	
2003	57	86	13 (15%)	31 (38%)	39 (45%)	33 (38%)

Summary

This is the fourth season of monitoring tour boats in the Shannon estuary. During the 2003 season trip records were received from 454 dolphin-watching trips, which is a 3% decline on 2002 and 4% on 2001. A factor in this apparent decline is the number of operators engaging in dolphin-watching during 2003. Although four companies received consent to dolphin-watch in the estuary during 2003 only three actually carried out trips. One operator (Saoirse Sea Sports carried out no trips due to their main vessel (Anna M) being out of the country for the whole of the season and another operator lost all

records due to the boat sinking. If the lost records from Ballybunnion are included then the total number of trips was around 464-474, which is more consistent with 2002 and 2001.

The results from this seasons monitoring were more similar to 2001 than 2002, suggesting 2002 was an atypical season in terms of dolphin distribution, abundance and behaviour. Prior to 2002 the mean length of trip and time to locate was remarkably consistent from 200-2001. The zones dolphins were located in were more typical of 2001, which was the first year these data were collected. Only the mean number of dolphins seen each trip was different during 2003, being higher than reported in previous years.

Concern was expressed last season at the total time on dolphins exceeding the 200 hour limit by 58%. This season, the total time on dolphins as determined by log-sheets was also greater than the 200 hour limit by 12.5%, however this figure is thought to be accurate this season which would indicate there was actually a decline in the total time spent watching dolphins. There is no evidence from the monitoring data of any change in the dolphin's distribution, relative abundance or behaviour caused by tour boats and the 200 hour limit should be reviewed.

Recommendations

The following recommendations for the 2004 season should be considered:

- i) the working definition of a dolphin group should be adopted,
- ii) the 200 hour limit to the total time on dolphins should be reviewed,
- iii) a review of the monitoring programme and efficacy of indices to measure change should be carried out.

Appendix I Bottlenose dolphin group definition – an aid for tour operators and managers

Group size in bottlenose dolphins depends on habitat and activity. It is fluid and dynamic and can change over very short time periods.

As part of the tour boat monitoring programme operators receiving consent to dolphinwatch in the Lower River Shannon cSAC are required to complete monitoring forms. These include recording the group size of dolphins being watched and the start and finishing time for which each group is watched. It has been recognised that in some circumstances it is not clear when a new group is being watched, or whether dolphins some distance apart are from the same group, as there can be a continuous distribution of dolphins throughout a dolphin trip.

In order to facilitate completion of tour boat monitoring requirements and especially to calculate the time on dolphins, the SDWF have been asked by the National Parks and Wildlife Service to recommend a **working definition** that can be used in this monitoring programme. This group definition is for management purposes and does not necessarily represent an ecological significant unit.

Background

The definition of group size has not been agreed upon by the scientific community. Definitions in published papers include:

1. Any aggregations of one or more dolphins (Hansen, L. 1990)
2. Dolphins sighted in a bay at any one time. A sub-group was defined as “individuals that were sighted in the same group repeatedly” (Balance, L. 1990).
3. All animals seen within a radius of approximately 100m (Wells, R. et al. 1980)
4. The smallest number of dolphins observed to be closely associating and engaging in similar activities. Primary groups may combine to form secondary groups for ranging periods (Wells, R. et al. 1980).
5. Any group of dolphins observed in apparent associations, moving in the same direction and often, but not always, engaged in the same activity (Shane, S. 1990).
6. All dolphins within 100m radius of each other engaged in similar activities an movement in the same direction (Irvine, A.B. et al 1981).

In those studies on bottlenose dolphins in the Shannon estuary, Berrow, Holmes and Kiely (1996) used a variation of number 5 namely “all dolphins in apparent association” and Ingram (2000) used a variation of number 6 “all dolphins within a 100m radius of each other”.

Definition for use in the Shannon tour boat monitoring programme

For tour boat monitoring a definition that is agreeable by all operators should be as objective as possible and robust enough to apply to the wide range of habitats and activities in which dolphins are watched. In the Shannon estuary dolphins are often seen spread out over a wide area, often in areas of strong current but engaged in the same activity (foraging). In these circumstances they may be moving in all directions but should be considered one group. To aid defining each group we can separate them either i) in space or ii) in time. The recommended working definition tries to combine both these variables.

Recommendations:

1. We recommend the use of “all dolphins within a 100m radius of each other and engaged in similar activity or, when travelling, not seen in a period of 5 minutes”.
2. This recommendation needs to be tested in the field.
3. In order to understand more fully the fluidity of dolphins and group size in the mouth of the Shannon, and to quantify the rate of exchange of dolphins between groups over hours and days, a dedicated photo-identification study is required. This study should be carried out from a tour boat to determine the effect of group composition on monitoring protocols.

Dr Simon Berrow, 1st July, 2003
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Appendix II: Vessels operating dolphin-watching trips in the Shannon estuary during 2003.

Company	Vessel	Number of trips
Dolphinwatch Carrigaholt	Draoicht	248
Scattery Island Ferries	St Sennan II	1
	Dolphin Discovery	205
Robert Stack	Lady Elish	(10-20)*

(* boat sunk on moorings in September, all trip records lost)

Appendix III: Checklist of monitoring indices collected during 2003.

Index	Biological aspect monitored ?	Port	
		C	K
1. Trip length	Distribution, abundance,	√	√
2. Time to locate	Distribution, reaction to tour boat	√	√
3. Location	Distribution	√	√
4. Total time on dolphins	Behaviour, tolerance ?	√	√
5. No. dolphins	Abundance, behaviour	√	√
6. No. groups	Abundance, behaviour	√	√
7. % groups with calves	Behaviour, breeding	√	√
8. Dolphin ID	Distribution, behaviour	√	√

Appendix IV: Map of Zones in which dolphins were watched.