

Shannon dolphin tour boat monitoring report – 2007

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Introduction

The Shannon estuary is a candidate Special Area of Conservation (cSAC) for bottlenose dolphins *Tursiops truncatus*. Commercial dolphin-watching is carried out within the estuary and is listed as a Notifiable Activity by the National Parks and Wildlife Service (NPWS). Consent is therefore required from the NPWS for those operators wishing to dolphin-watch within the cSAC. All operators receiving consent are required to “provide 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 carry implement this monitoring in compliance with the EU Habitats Directive during the 2007 season.

Methodology

Operators are required to fill out a log-sheet for each dolphin-watching trip they carry out. No list of accredited operators was forwarded to SDWF for the 2007 season so we relied on local knowledge of who was intending to dolphin-watch during this season (Appendix I). 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 the time for which each group was watched. Following recommendation 1 in 2005 the log sheets were redesigned, which resulted in one for the inner estuary and one for the outer estuary to ensure operators can plot their route and the location of dolphins watched, as accurately as possible.

Photo-identification is carried out on a sample of trips (target 10% of total trips) to determine which dolphins are being watched from tour boats. This also provides an opportunity to cross reference operator’s records with SDWF records to assess their interpretation of the monitoring indices that they are required to record.

Results

Of the 407 log-sheets received during 2007, 15 (3.6%) of log-sheets had data on trip length missing (on 14 trips from Kilrush and 1 from Carrigaholt). During 2007, 47 trips were accompanied (25 from Kilrush and 22 from Carrigaholt) which was 11.5% of the total carried out. This exceeded the target of

10% for the season. Data for eight monitoring indices were collected during 2007 and results are presented below.

1. *Number of operators and trips*

As far as the SDWF is aware, only two companies with one vessel each carried out dolphin-watching in the Shannon estuary cSAC during 2007 (Appendix I). The total reported number of trips (407) were 4 (1.0%) more than reported in 2006 with trips from Carrigaholt up by 0.5% and Kilrush up by 1.5%. Monthly distribution of trips was consistent with previous years with 60% carried out in July and August. Of the total number of trips, 208 (51.1%) departed from Kilrush and 199 (48.9%) departed from Carrigaholt in County Clare (Table 1).

Table 1. Number of dolphin-watching trips carried out from two ports in County Clare in the Shannon estuary during 2007

Month	Port		Total (%)
	Carrigaholt	Kilrush	
April	14	20	34 (8.4)
May	12	14	26 (6.4)
June	29	25	54 (13.3)
July	55	56	111 (27.3)
August	69	71	140 (34.4)
September	18	17	345 (8.6)
October	2	5	7 (1.7)
Total	199	208	407

2. *Length of trip*

The mean length of each dolphin-watching trip is shown in Table 2 together with the same data from previous years. The mean length was greater from Kilrush than Carrigaholt and 4.7 and 6.1% greater than reported in 2006 (Table 2).

Table 2. Mean length (minutes) of dolphin-watching trips from 2000 – 2007

Port	Year						
	2000	2001	2002	2003	2005	2006	2007
Carrigaholt	119.6	124.9	123.6	117.8	118.6	119.1	124.7
Kilrush	133.1	129.7	125.6	115.2	110.6	119.7	127.0

3. *Time to locate dolphins*

Dolphins were located on 97% of trips overall with only six trips from both Carrigaholt and Kilrush failing to locate dolphins. On one trip (30 June) a single common dolphin *Delphinus delphis* was seen

off Kilcredaun Point near Carrigaholt. The mean time to locate dolphins (29.9 minutes) from Carrigaholt was consistent with previous years but from Kilrush was on average 7 minutes longer in 2007 (44.2 minutes) compared to 2006 (37.4 minutes). This was an increase of 18.7%, which is quite considerable. The time to locate dolphins from Carrigaholt generally increases through the summer and is consistent with previous years. A similar trend is apparent from Kilrush with the exception of June which reports a mean of 48.6 minutes, an increase of 29% on May and 16% on July.

Table 3. Mean time (minutes) to locate dolphins from the two ports during the 2007 season (only those trips which observed dolphins are included)

Month	Carrigaholt	Kilrush
April	39.5	45.3
May	22.7	37.7
June	21.1	48.6
July	23.3	41.8
August	33.1	41.9
September	34.5	56.5
October	98.5	51.0
November	-	-
Mean	29.9	44.2

4. Location of dolphin groups

The tour boat operating from Carrigaholt located most dolphins in Zones 1 (59.5%) and 2 (24.2%) (Table 4), which shows a change from previous years where a larger proportion of dolphins were located in Zone 3 (see Appendix II for location of Zones). This amounts to a change of around 6% from Zone 3 to Zone 2.

Table 4: Zones in which tour boats watched dolphins from each port during 2007

Zone	Carrigaholt	Kilrush	Total
	No. (%)	No. (%)	No. (%)
1	113 (59.5)	3 (1.4)	116 (29.1)
2	46 (24.2)	3 (1.4)	49 (12.3)
3	31 (16.3)	25 (12.0)	56 (14.1)
4	-	27 (13.0)	27 (6.8)
5	-	18 (8.6)	18 (4.5)
6	-	62 (29.8)	62 (15.6)
7	-	70 (33.6)	70 (17.6)
Total	193	202	395

Tour boats from Kilrush tended to watch dolphins in Zones 7 (33.6%) and Zone 6 (29.8%), which is consistent with previous years however there was a 5% increase in the location of dolphins in Zone 5 and a corresponding 4% decrease in Zone 4. This slightly reverses a difference in 2006 where dolphins were located more in Zone 4 than Zone 5 than previously. This might reflect a change in the distribution of dolphins with more dolphins occurring to the south of the estuary compared to the north. A similar proportion of dolphins were located in Zone 3 to previous years.

5. Time on dolphins

The total time on dolphins for all vessels during 2007 was calculated as 12,615 minutes or 210.25 hours (Table 5). This is an overall decrease of 4% on 2006. The decrease was greater by the Carrigaholt boat, which reported a 6.1% decrease in overall time on dolphins, compared to 2.3% by the Kilrush boat. A total of 325 dolphin groups were watched from Carrigaholt and 264 from Kilrush. The requirement to spend only 30 minutes per group per trip was exceeded on 13 occasions from Carrigaholt, but only by an average of 1.75 minutes. The 30-minute limit was exceeded on 26 occasions from Kilrush, with a maximum of 45 minutes on one group of dolphins but with a mean of only 5.6 minutes. This is a great improvement on 2006 when Kilrush exceeded the limit on 128 occasions.

Table 5. Total time (minutes) on dolphins from the two ports during 2007 season (different groups observed within a trip are indicated)

Month	Carrigaholt					Kilrush				
	G1	G2	G3	G4	Total	G1	G2	G3	Total	Total
April	232	91	2	0	325	485	165	20	670	995
May	194	76	10	0	280	325	130	0	455	735
June	479	122	48	0	649	622	252	61	935	1584
July	1132	549	77	4	1762	1562	418	0	1980	3742
August	1419	562	58	1	2040	2005	197	0	2202	4242
September	418	178	1	0	597	490	20	0	510	1107
October	50	0	0	0	50	135	25	0	160	210
Total										
-minutes	3924	1578	196	5	5703	5624	1207	81	6912	12615
-hours	65.4	26.3	3.3	0.1	95.1	93.7	20.1	1.3	115.2	212.5

The mean time on dolphins per group per trip was 17.5 minutes from Carrigaholt, and 26.2 minutes from Kilrush, both within the time allowed under the Code of Conduct. The overall average time per group per trip from both ports combined was 21.4 minutes.

6. *Number of dolphins and groups*

In previous seasons, the tour boat from Carrigaholt tended to watch more groups of dolphins on each trip compared to Kilrush. However during 2007 the mean number per trip was much closer than in previous years with 1.6 groups observed per trip from Carrigaholt and 1.3 groups per trip from Kilrush. This is as a result of an increase from Kilrush and a decrease from Carrigaholt. The number seen per trip from Carrigaholt decreased by 24% compared to 2006 (1.6 compared with 2.1).

A similar trend has been reported for mean group size with numbers very similar at 9.9 from Carrigaholt and 9.3 from Kilrush. This is a decrease of 25% in mean group size from Kilrush. These data suggest that either dolphins watched by the Kilrush boat are splitting into smaller but more abundant groups or perhaps a change in the interpretation of what defines a group of dolphins. This reinforces the opinion stated in 2006 that there has been a reduction in the number of dolphins watched by tour boats in both the outer and inner estuary.

Table 6. Mean number of dolphin groups and group size encountered during 2007

Month	Carrigaholt		Kilrush	
	Group	Group size	Group	Group size
April	1.5	7.4	1.4	8.3
May	1.5	7.4	1.4	7.9
June	1.8	8.4	1.6	7.6
July	1.8	11.1	1.3	8.6
August	1.6	8.7	1.1	10.9
September	1.6	9.4	1.1	12.1
October	1.0	10.5	1.2	9.8
Mean	1.6	9.0	1.3	9.3

7. *Number of groups with calves*

Of the 193 trips from Carrigaholt with sightings, calves were present on 127 (65.8%), which is consistent with previous years. From Kilrush, calves were present on 50% of the 202 trips where dolphins were observed, which is a 10% decrease on 2006. These data show that breeding groups are subjected to dolphin-watching in the Shannon estuary.

8. *Individual dolphins watched from tour boats*

Whenever possible, the individual dolphins watched from tour boats were recorded using photo-identification. During 2007, 47 trips were sampled (25 from Kilrush and 22 from Carrigaholt), which was 11.5% of the total carried out (Table 7). Dolphins were observed on 43 (91.2%) of trips sampled.

The SDWF catalogue contains images from 207 individually recognisable bottlenose dolphins (Appendix III). A total of 32 individual dolphins were identified from tour boats during 2007

and of these 25 (78%) had been previously recorded and 7 were previously unrecorded (Figure 1). As in the previous two years around 57% of these recognisable dolphins were watched the previous year and 16% had been watched in 1999. This suggests that although fewer dolphins than in recent years were captured using photo-ID the trend was similar.

Table 7: Number of identifiable dolphins recorded from tour boats, 1999-2007

Year	No. of trips	No. of identified dolphins	Number (%) of dolphins recorded from tour boats in previous years							
			1999	2000	2001	2002	2003	2005	2006	
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%)	32 (37%)	-	-	-	-
2005	43	68	13 (19%)	21 (31%)	20 (30%)	22 (32%)	39 (57%)	-	-	-
2006	43	61	6 (10%)	15 (24%)	19 (31%)	18 (30%)	30 (49%)	35 (57%)	-	-
2007	47	32	5 (16%)	12 (38%)	7 (21%)	10 (31%)	19 (59%)	17 (53%)	18 (56%)	-

The proportion of dolphins re-sighted each year is shown in Figure 1. This shows that most dolphins are recorded only once with a corresponding decrease with time. Only one individual dolphin has been recorded each year, 1999 to 2007 and 13 in five of the previous 8 years (Appendix III).

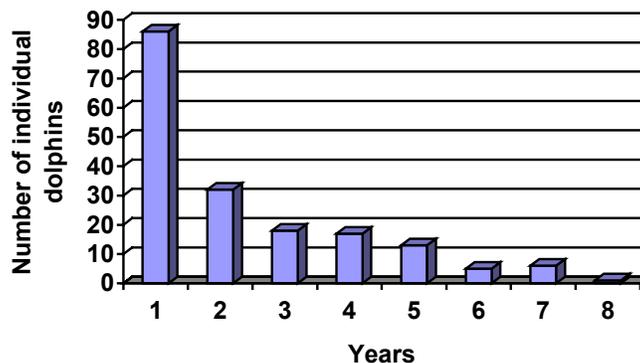


Figure 1. Frequency of re-sightings of individual dolphins over an eight year period (1999-2007)

Comparison between SDWF data and operators logbooks

Data from monitoring forms received from each operator were compared with data recorded by the SDWF for the same trip. This enabled a comparison to be made between the operators interpretation of the monitoring data with that made by the SDWF researchers.

On the vessel from Carrigaholt (Draoicht), the observer is on the main deck and has little contact with the skipper who is in an elevated wheelhouse, thus there is no possibility of one passing on

information to the other. This is not the case on the Kilrush boat (Dolphin Discovery) where observer and skipper/deck hand are in close proximity. A summary of this comparison is shown in Table 8. Only differences in the most important monitoring indices are shown.

Table 8: Mean (range) differences in data collected by operators and the SDWF on the same trip

Monitoring Index	Dolphin Discovery (n=25)	Draiocht (n=22)	Mean (n=44)
Time to locate dolphins (mins)	1.19 (-15 to +20)	-2.29 (-25 to +6)	-0.60
Number of groups	-0.05	-0.05	-0.05
Group size	0.30 (-6 to +18)	1.44 (-13 to +24)	0.90
Time on dolphins (mins)	0.79 (-30 to +30)	1.28 (-16 to +18)	1.08

On 11 trips from Carrigaholt and 10 trips from Kilrush the SDWF recorded a longer duration to find dolphins than operators. However the mean difference was only 1.19 minutes more from Kilrush and 2.20 minutes less from Carrigaholt (Table 8). There was little difference in the estimated number of groups per trip. On 19 trips from Carrigaholt the operators estimated group size to be less than SDWF and on 15 trips from Kilrush. The mean difference was greater from Carrigaholt with SDWF consistently over-estimating group size. Finally SDWF also recorded a greater time on dolphins from both ports but although the range was great the mean difference was small 0.8-1.3 minutes (Table 8).

It is difficult to interpret the wide range in differences in some of these parameters, especially in estimates of group size. This could be a component of difficulties in determining when a group starts and finishes. However overall the mean differences in interpretation of these monitoring indices between the operators and SDWF are small and would not significantly alter the overall results.

Summary and Conclusions

This is the eighth season of monitoring dolphin tour boats in the Shannon estuary. Trip records were received from 407 dolphin-watching trips, which was 1.0% more than 2006. This reverses a trend with trip numbers down each previous year since 2001. The recommendations to the operators from 2006 have been adopted which has led to nearly a full dataset from which to derive monitoring indices and a reduction in the mean time on each dolphin group by Kilrush boats.

Trip length increased from both ports in 2007, especially from Kilrush and time to locate dolphins from Carrigaholt increased by 18.7%. There was a change in the location dolphins were watched from Kilrush from Zone 4 (north side of the inner estuary) to Zone 5 (south side of inner estuary) and Carrigaholt boats spending less time in Zone 3 (Beal bar). The number of groups located by the Carrigaholt boat decreased by 24%, though group size was consistent with previous years. Group size

from Kilrush decreased by 25% though the number of groups watched per trip increased from 1.1 to 1.3. The data from the photo-identification was consistent with nearly two-thirds of dolphin observed were the same dolphins in the previous year. Overall, despite an increase of 1% in the total number of trips carried out during 2007, there was a 4% decrease in the total time on dolphins.

Clearly there have been some significant changes in the monitoring indices during 2007, especially in the outer estuary. Increased trip length and time to locate and a decrease in the number of groups watched per trip may indicate that fewer dolphins were in the outer estuary. However a recent study by Englund *et al.* (2007) estimated the bottlenose dolphin population in the estuary is increasing, which if correct, suggests that some other factors are driving the changes reported here.

Recommendations

Clearly there are inter-annual changes in the distribution and group composition of dolphins in the estuary and only continuation of long-term monitoring will help to understand trends. Given the trends in the monitoring data presented here, it is recommended that a detailed analysis of the monitoring data is carried out, examining inter and intra-annual trends.

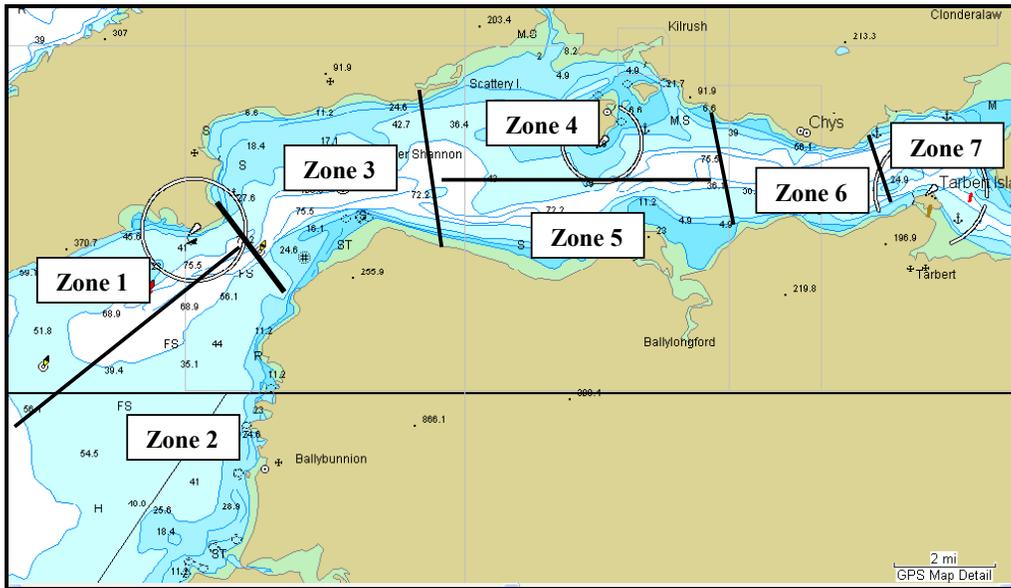
References

Englund, A., Ingram, S. and Rogan, E. (2007). Population status report for bottlenose dolphins using the Lower River Shannon SAC, 2006-2007. Final report to the National Parks and Wildlife Service.

Appendix I: Vessels known to be operating dolphin-watching trips in the Shannon estuary during 2007

Company	Port	Vessel	Number of trips
Dolphinwatch	Carrigaholt	Draocht	199
Scattery Island Ferries	Kilrush	Dolphin Discovery	208

Appendix III: Tour boat monitoring form, showing zones in which dolphins were watched



Zone 1: line from Kilcredaun to Kilconly Point and north of line down middle of estuary

Zone 2: line from Kilcredaun to Kilconly Point and south of line down middle of estuary

Zone 3: between line from Kilcredaun to Kilconly Point and from Corlis Point to Littor House

Zone 4: north of line down middle of estuary and between line from Corlis Point to Littor House and from Moyne to Knockfinglas Point

Zone 5: south of line down middle of estuary and between line from Corlis Point to Littor House and from Moyne to Knockfinglas Point

Zone 6: between line from from Moyne to Knockfinglas Point to a line between Besborough and Hassey's Hill

Zone 7: upriver of a line between Besborough and Hassey's Hill

Appendix IV: Individual dolphins recorded from tour boats 1999-2007

Identification No	Year								Total years sighted
	1999	2000	2001	2002	2003	2005	2006	2007	
1		*			*	*	*	*	5
2			*	*	*	*	*	*	6
4	*	*			*				3
5						*			1
6		*			*		*		3
7			*	*	*	*			3
8	*	*	*	*	*	*	*		7
9							*		1
10				*	*				2
11	*	*	*	*	*	*	*	*	8
13						*			1
14				*	*				2
15						*			1
16				*	*				2
18		*	*	*	*	*	*	*	7
19	*	*	*	*	*	*	*		7
20		*		*	*	*		*	4
21				*	*	*	*		4
23			*		*				2
24		*	*		*	*	*		5
27	*			*	*	*			4
28	*	*	*	*	*	*		*	7
30		*							1
31					*	*	*		3
33		*	*		*				3
34	*	*	*	*	*	*	*		7
35		*	*	*	*				4
36		*	*		*				3
38	*		*		*				3
40		*		*					2
41		*	*		*				3
42		*				*	*	*	4
43				*					1
44	*		*	*					3
45				*	*	*	*	*	5
46						*			1
47	*	*	*	*					4
49			*	*	*				3
50				*	*				2
51				*	*	*	*		4
52	*	*		*	*	*	*	*	6
53	*		*	*	*				4
54	*	*	*		*	*			5
55	*	*			*	*			4
56					*				1
57	*			*		*			3
58	*								1
59		*	*	*	*	*			5
60	*	*		*	*	*			5
61		*		*					2
62	*	*	*	*	*		*	*	7
63		*							1
64		*	*	*	*	*			5
65		*							1

66		*		*	*		*		4
67		*	*	*	*		*		5
68		*		*					2
69					*				1
70		*			*				2
71		*			*	*			3
74					*				1
75					*				1
76				*	*	*			3
77	*	*		*	*				4
78		*							1
79					*				1
80		*	*	*	*	*	*		6
81					*	*	*		3
82	*			*	*				3
83	*	*	*		*	*			5
84				*	*	*			3
85		*			*	*	*	*	5
86				*	*				2
87				*	*		*	*	4
88				*					1
89			*			*			2
90			*		*				2
91				*					1
92			*	*	*				3
93		*	*	*	*		*	*	6
94			*	*	*		*		4
95			*			*			2
96			*	*	*	*			4
97	*		*	*	*	*			5
98		*	*	*	*	*			5
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124					*				1
125					*		*		2
126					*	*	*	*	4
128		*							1

129	*							1
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133				*				1
137				*				1
138				*				1
139				*				1
141		*						1
142		*		*				2
143		*						1
144		*	*	*	*	*	*	6
145				*				1
146				*	*			2
147				*	*		*	3
148				*	*	*	*	3
149				*				1
150				*				1
151				*	*			2
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198					*			1
200					*			1
201						*	*	1
202						*	*	1
203						*	*	1

204	*	1
205	*	1
206	*	1
207	*	1
