

DUBLIN WASTE TO ENERGY FACILITY

WILDFOWL MONITORING
WINTER 2014 / 15

SEPTEMBER 2015

REPORT PREPARED FOR
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1. INTRODUCTION.

Planning approval for the Dublin Waste to Energy Facility was granted by An Bord Pleanála in November 2007, subject to a number of conditions. This report has been prepared in compliance with Condition 13 (b), which includes a requirement for waterfowl monitoring as follows:

“Monitoring of the use by wild fowl of the grass lands located south of the wastewater treatment plant shall be carried out for a period of at least 1 year prior to the enclosure and use of the temporary construction area, during construction works and for a period of at least three years following the commissioning of the plant. Reports on the monitoring shall be prepared at least twice yearly following the commencement of construction works. Copies of the reports shall be available for inspection by the public at the offices of the local authority and at an office in the Ringsend/Poolbeg area.”

The grassland area referred to in Condition 13 (b) was provided as a winter feeding area for Light-bellied Brent Geese *Branta bernicla hrota*, under condition No. 10 of the 1997 certification for the Dublin Bay Project extension to Ringsend Waste Water Treatment Plant (WWTP). It lies to the east of the temporary construction compound for the Dublin Waste to Energy Facility, to the south of Ringsend WWTP, and to the north of Irishtown Nature Park. The area is shown in Figure 1 below, and is known variously as Goose Green, the DCC Brent Field Ringsend (Benson, 2009), and as the compensatory grassland. This report presents the results of the waterfowl monitoring carried out between September 2014 and April 2015, covering the winter season during which Brent Geese in particular use the grassland area referred to in Condition 13 (b), and in order to comply with the requirement to prepare reports at least twice yearly following the commencement of construction works.

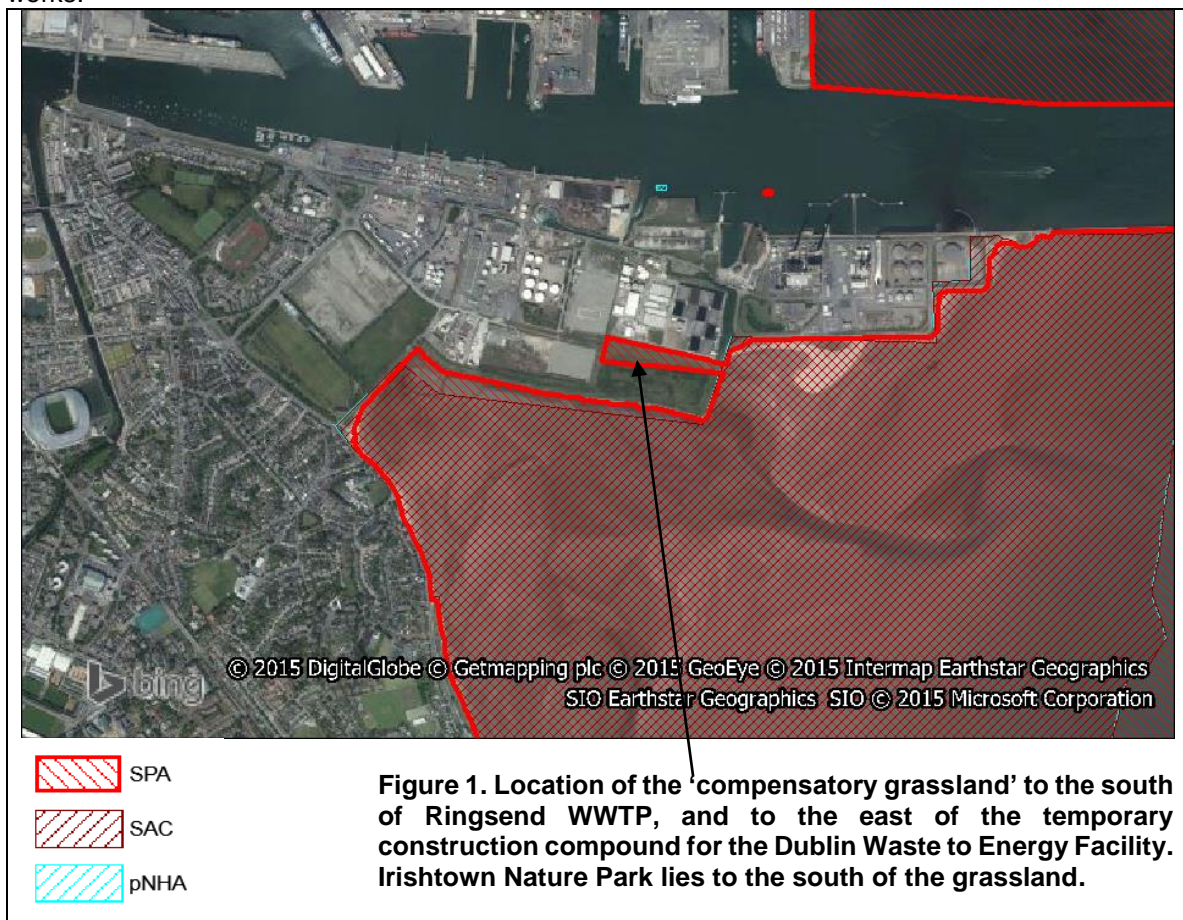


Figure 1. Location of the 'compensatory grassland' to the south of Ringsend WWTP, and to the east of the temporary construction compound for the Dublin Waste to Energy Facility. Irishtown Nature Park lies to the south of the grassland.

The National Parks and Wildlife Service (NPWS) of the Department of Arts, Heritage and the Gaeltacht proposed to extend the boundary of a Special Protection Area (SPA) designated under the Birds Directive (79/409/EEC; 2009/147/EC) to include this grassland, in a notification dated 23 May 2008 relating to South Dublin Bay and River Tolka Estuary SPA (Site Code 004024). The extended boundary was confirmed in S.I. 212 of 2010.

2. MONITORING METHODOLOGY.

Detailed wildfowl counts, and counts of goose droppings which provide a metric of goose grazing intensity, were scheduled to cover the period when Light-bellied Brent Geese feed on grassland, because this is the species which makes most seasonal use of grassland areas, and the grassland referred to in Condition 13 (b) was provided specifically for geese. The detailed monitoring season was initially defined as extending from mid-November to mid-April, based on observations during the 1990s and early to mid 2000s. Checks of the grassland for waterbird¹ use are carried out during the summer and autumn also, with checks of intertidal areas to assess autumn arrival of Light-bellied Brent Geese in Dublin Bay.

Following the completion of winter monitoring in April 2014, the compensatory grassland was checked for the presence of wildfowl and waterbirds during the summer and autumn. Checks of intertidal areas in South Dublin Bay for Light-bellied Brent Geese commenced on 19th August 2014 and continued at approximately weekly intervals.

The compensatory grassland was walked on 26th September, 8th, 14th and 23rd October, and on 6th and 17th of November 2014 to check for goose feeding signs (droppings); none were recorded. Light-bellied Brent Geese started to visit the compensatory grassland in small numbers from 20th November 2014. Direct waterbird counts and transect counts of goose droppings on all monitored grasslands (compensatory grassland, Ringsend Park, Irishtown Stadium, and Sean Moore Park) started on 26th November for the 2014/15 winter season.

Waterfowl were counted from vantage points using binoculars and a telescope. In addition to the grassland located south of the wastewater treatment plant and adjoining the DWTE site and temporary construction compound, the following grassland areas were included in the monitoring programme: Ringsend Park, Irishtown Stadium, and Sean Moore Park. The rationale for including the three additional grassland areas is that they are also used by Brent geese, and there is frequent movement of geese between all four grassland areas arising from disturbance due to sports and recreational use as well as construction work in different areas. It would be difficult to interpret counts from the compensatory grassland on its own, since variation in use could arise from factors other than DWTE construction disturbance, and it would be useful for these to be identifiable. The amenity grassland area beside the Ringsend Waste Water Treatment Works storm water tanks (on the northern side of Pigeon House Road) have been checked for the presence of Brent geese since January 2014.

Goose use of the four grassland areas (the compensatory grassland, Ringsend Park, Irishtown Stadium, and Sean Moore Park) was also assessed indirectly by counts of droppings along transects, so that grazing intensity could be assessed in the different areas, and with regard to distance from the DWTE site and construction compound. In general, counts were scheduled for

¹ 'waterbird' is a collective term for swans, geese, ducks, wading birds, gulls and terns, and other groups that depend on wetland habitats. Some, but not all, of these groups use the grassland subject to condition 13(b).

periods of dry weather to minimise washing out of goose droppings by rainfall. Dropping density was calculated per metre² to facilitate comparison between areas. Transects were laid out using measurements and landmarks within the compensatory grassland as shown in Figure 2 below.



Figure 2. Transect layout on the compensatory grassland

Transect 1 lies 10 metres away from the boundary fence between the compensatory grassland and Ringsend WWTP. Transect 2 lies parallel to transect 1. Both transects are divided into three sections A, B and C, as indicated by circles on Figure 2. The transects are equidistant from the mounded inspection access to the submarine pipeline, visible as a white area which is the landmark for transect sections A/B. Transect 10 lies 10 metres from the western edge of the compensatory grassland, T30 and T60 are 30 and 60 metres from the western edge of the grassland respectively.

Within the other grassland areas monitored, single transects were monitored in each of the eastern and western pitches at Sean Moore Park, in Irishtown Stadium, and in Ringsend Park, with transect lines along the length of the pitch at 10 metres towards the side from a goal post.

3. CONSTRUCTION AND OTHER ACTIVITIES AFFECTING GRASSLANDS IN THE AREA.

3.1. Compensatory grassland management.

During the first wildfowl monitoring season for the Dublin Waste to Energy Facility in 2007/08, goose use varied substantially between different areas of the compensatory grassland, in response to variations in grass cover, and to the proximity of scrub encroaching towards the grassland which geese tend to avoid. Disturbance due to human and dog activity within the grassland area was also a factor. A management plan addressing these issues was prepared for Dublin City Council, in consultation with NPWS, and was implemented in 2008:

1. Soil compaction and sparse grass cover on part of the 2ha area, in the area of transect T1C, was addressed by spiking with a verti-drainer, re-seeding grass, and by improving soil fertility
2. Scrub encroachment on the sloping ground between the grassland and Irishtown Nature Park, and along part of the boundary with Ringsend WWTP, was addressed by cutting and removal

3. Disturbance by pedestrians, particularly when accompanied by dogs, which has been addressed by fencing the eastern end of the grassland and the provision of public information notices requesting co-operation.

Some new fencing and signage was installed by Dublin City Council Parks Department, at the top of the sloping ground between Irishtown Nature Park and the compensatory grassland during the autumn of 2010, with the aim of reducing disturbance by pedestrians and dogs to geese using the grassland. Repairs to the fencing at the eastern end of the compensatory grassland were also carried out in 2010.

Routine mowing and maintenance work was carried out during the summer and autumn of 2014. Top-dressing of the grassland with fertiliser was carried out by Dublin City Council Parks Department in October 2014. Grass continued to grow during mild late autumn weather and the compensatory grassland was mown in late October and again in early November. Dublin City Council Parks Department also carried out repairs to the fencing at the eastern end of the compensatory grassland in early November 2014.

3.2. Other activities in the compensatory grassland.

No engineering works were noted in the compensatory grassland during the 2014/15 season. Dog walking within the grassland continued to occur. Dog tracks were observed, and a dog walker appeared to be bringing up to ten dogs to run on the compensatory grassland on most days, approaching from the west, and later from the south after the temporary construction compound was enclosed in January 2015.

3.3. Dublin Waste to Energy Facility activities.

Further to a commencement notice issued to Dublin City Council, construction work on the Dublin Waste to Energy Facility commenced on 14th December 2009. Work was suspended temporarily in May 2010. The Project Agreement regarding the Dublin Waste to Energy Facility was signed on Friday 19th September 2014. Site clearance and setup commenced in October. Piling works at the approved project site, using Continuous Augered Piles (CFA Piles), commenced during the week starting 20th October, initially with one piling rig and subsequently with three rigs. Piling and foundation works continued through the winter season. Construction of above ground structures commenced in March 2015. The temporary construction compound was enclosed in January 2015, with work on the eastern boundary closest to the compensatory grassland taking place during the week commencing 12th January. A setback of at least 20 metres wide from the eastern edge of the compound was provided, as required under Condition 13(b).

3.4. Other grasslands in the Ringsend area.

The running track at Irishtown Stadium was partially re-surfaced during the summer of 2014, but not completed. The running track and pitch were little used during the winter of 2014/15, and no measures such as decoys or plastic tapes to deter geese from feeding on the pitch were observed.

4. WILDFOWL COUNTS.

4.1. Light-bellied Brent Geese.

4.1.1 Overall population and numbers in Dublin Bay

A peak count of 1,367 Light-bellied Brent Geese was recorded in South Dublin Bay at dusk on 28th January 2015. The threshold for international importance for this predominantly Irish wintering population was raised in 2012 (Wetlands International, 2013), following a sustained increase in numbers; the 1% level is currently 400 birds (formerly 260 birds). However the population has declined recently following two poor breeding seasons in 2013 and 2014; a total of 31,985 geese were recorded in the southern part of the wintering range (excluding Iceland) in November 2014 (I-WeBS News 2015). Peak counts in previous years are given in Table 1.

	Dublin Bay	South Dublin Bay
2014/15	I-WeBS data not yet available	1,367
2013/14	3,717*	1,310
2012/13	6,134*	2,693*
2011/12	4,102*	1,950
2010/11	4,745	1,730
2009/10	5,536*	1,870
2008/09	4,445*	1,425*
2007/08	3,819*	510*

Table 1. Peak counts of Light-bellied Brent Geese in Dublin Bay and in South Dublin Bay.

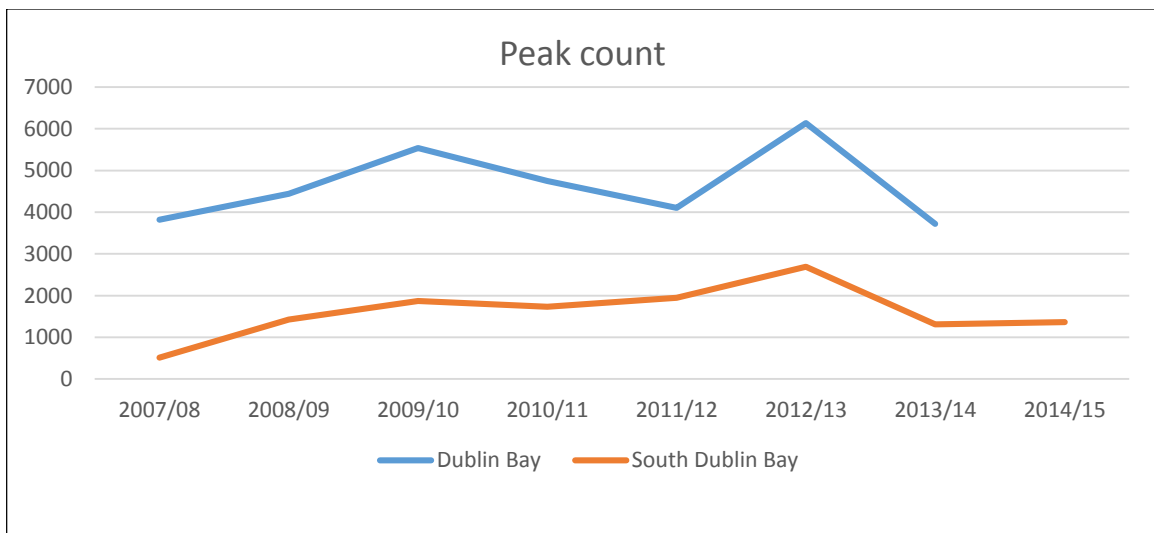


Figure 3. Peak counts in Dublin Bay and South Dublin Bay

Note: * Data were supplied by the Irish Wetland Bird Survey (I-WeBS), a joint scheme of BirdWatch Ireland and the National Parks and Wildlife Service of the Department of Arts, Heritage & the Gaeltacht. Other counts not indicated with an asterisk are data recorded as part of the monitoring programme for the Dublin Waste to Energy Facility. The highest count in these two datasets is given.

4.1.2. South Dublin Bay and monitored grasslands

Brent Geese were first recorded feeding in intertidal habitats in South Dublin Bay on 20th September 2014, when 15 birds were observed feeding on the *Zostera* bed near Merrion Gates. Autumn counts are included in Table 2. Peak counts in each winter season since the commencement of the monitoring programme are included in Table 3. Most geese were recorded feeding on the *Zostera* bed near Merrion Gates initially, but geese also fed on green macroalgae *Enteromorpha* spp. growing in low tide channels, in sheltered areas to the south of the Poolbeg peninsula, and in the developing salt marsh east of Merrion Gates, as *Zostera* stocks became depleted. There was a high standing crop of green macroalgae in intertidal habitats in Dublin Bay during the autumn of 2014, related to prolonged warm sunny weather. Brent geese continued to feed on green macroalgae in December, with 225 birds feeding to the south of the Poolbeg peninsula on 15th December at 8.50 am.

Date	Grasslands						Intertidal sand and mudflats
	Compensatory Grassland	Sean Moore Park East	Sean Moore Park West	Irishtown Stadium	Ringsend Park	WWTW storm tanks	South Dublin Bay
20.09.14							15
26.09.14							10
28.09.14							22
8.10.14							107
15.10.14							206
23.10.13							220
1.11.14							161
6.11.14							9
17.11.14							279
26.11.14	184			71			not counted
5.12.14	331			17			*481
15.12.14	2			1		126	**c. 470
5.01.15	18			66			not counted
12.01.15	151			11			not counted
15.01.15	87						**1,316
28.01.15	147	16	9	180			**1,367
18.02.15	132			23			*1,125
6.03.15	158			55			not counted
19.03.15	69			1			195
10.04.15	40			89			not counted
Peak Count in 2014/15	331	16	9	180			1,367

Table 2. Peak counts of Light-bellied Brent Geese from September 2014 to April 2015.

Notes: Counts of the intertidal sand and mudflats in South Dublin Bay carried out as part of this monitoring programme include *dawn or **dusk roost counts. Dawn and dusk roost counts are generally higher than day time counts in mid-winter, when geese are feeding on grassland sites in the greater Dublin area during the day. Counts are not additive, because of goose movement between areas.

Blank cells indicate that no Light-bellied Brent Geese were present when individual sites were checked.

Date	Grasslands						Intertidal sand and mudflats
	Compensatory Grassland	Sean Moore Park East	Sean Moore Park West	Irishtown Stadium	Ringsend Park	WWTW storm tanks	South Dublin Bay
2014/15	331	16	9	180		126	1,367 roost count
2013/14	411	225		220	575	67	1,310 roost count
2012/13	351	600	223	47	680	nc	2,693 roost count*
2011/12	336	29	14	346	205	nc	1,950 roost count
2010/11	410	90	101	450	283	nc	1,730 roost count
2009/10	349	950	600	338	480	nc	1,870 roost count
2008/09	440	55	10	199		nc	1,425*
2007-08	34	600	350	366		nc	510*

Table 3. Peak counts of Light-bellied Brent Geese in each area, in each year of the monitoring programme to date

*I-WeBS counts. * Data were supplied by the Irish Wetland Bird Survey (I-WeBS), a joint scheme of BirdWatch Ireland and the National Parks and Wildlife Service of the Department of Arts, Heritage & the Gaeltacht. Counts not indicated with an asterix are data recorded as part of the monitoring programme for the Dublin Waste to Energy Facility. The highest count in these two datasets is given.

Light-bellied Brent Geese started to visit the compensatory grassland in small numbers from 20th November 2014, and were first seen at Irishtown Stadium on 21st November, as reported by staff. When surveyed on 26th November (Plate 1), almost all droppings were fresh at both grasslands.

The peak count of Light-bellied Brent Geese on the compensatory grassland was 331, recorded on 5th December 2014 (Plate 2). The grassland was checked on 11 dates between 26th November 2014 and 10th April 2015; geese were recorded feeding on the grassland on all dates. Average flock size through the winter was 120 geese. Flocks of 151 and 87 were recorded feeding on the grassland during the week in January when the eastern end of the temporary construction compound was being enclosed.

Peak counts of Light-bellied Brent Geese recorded on other grasslands in the Ringsend area were 180 on Irishtown Stadium, 16 on Sean Moore Park, and none on Ringsend Park, although counts of goose droppings did indicate minor use by geese during the winter of 2014/15.

Light-bellied Brent Goose use of the grasslands as indicated by the density of droppings/m² provides a more reliable index of overall feeding use than direct counts of birds. Monitoring of dropping density along transects commenced on 26th November 2014, and continued through the winter of 2014/15. These data are given in Section 5 of this report.



Plate 1. Brent geese on the compensatory grassland on 26th November 2014.



Plate 2. Part of a flock of 331 Brent geese on the compensatory grassland on 5th December 2014. Three piling rigs can be seen on the Dublin Waste to Energy Facility construction site in the background.

4.2. Other waterbird species.

Four wader species were recorded in small numbers on the compensatory grassland between November 2013 and April 2014: Oystercatcher, Black-tailed godwit, Curlew, and Redshank (Table 4). Black-headed Gulls were recorded on a single occasion.

Date	Compensatory grassland	Sean Moore Park	Irishtown Stadium	Ringsend Park
26.11.14	44 Oystercatcher 1 Curlew	3 Oystercatcher	2 Oystercatcher	2 Oystercatcher
5.12.14	41 Oystercatcher 3 Black-tailed godwit 1 Curlew 2 Redshank 3 Black-headed gulls	17 Oystercatcher	1 Oystercatcher 25 Black-headed gulls	62 Black-headed gulls
15.12.14	3 Oystercatcher 2 Black-tailed godwit 2 Redshank	21 Oystercatcher		1 Oystercatcher 18 Black-headed gulls
5.01.15	23 Oystercatcher 1 Redshank	13 Oystercatcher	20 Oystercatcher 15 Black-headed gulls	1 Oystercatcher 41 Black-headed gulls
28.01.15		12 Oystercatcher	2 Oystercatcher	1 Oystercatcher 29 Black-headed gulls
18.02.15	11 Oystercatcher 1 Curlew	4 Oystercatcher 1 Black-headed gull	14 Black-headed gulls	61 Black-headed gulls
6.03.15		12 Oystercatcher 22 Black-headed gulls		27 Black-headed gulls
19.03.15				
10.04.15				
Peak counts in 2013/14	47 Oystercatcher 3 Black-tailed godwit 2 Redshank	41 Oystercatcher 4 Redshank	25 Oystercatcher 20 Black-headed gull 4 Herring gull	18 Oystercatcher 80 Black-headed gull
Peak counts in 2012/13	11 Oystercatcher 12 Redshank 3 Mallard	9 Oystercatcher 18 Redshank 150 Black-headed Gulls	9 Oystercatcher 21 Black-headed Gulls 1 Herring Gull	1 Oystercatcher 97 Black-headed Gulls 5 Common Gulls
Peak counts in 2011/12	64 Oystercatcher 15 Black-tailed Godwit 2 Curlew 11 Redshank	30 Oystercatcher 8 Black-headed Gulls	17 Oystercatcher 1 Common Gull 66 Black-headed Gulls 2 Herring Gulls	9 Oystercatcher 37 Black-headed Gulls
Peak counts in 2010/11	21 Oystercatcher 11 Black-tailed Godwit 1 Curlew 7 Redshank 12 Black-headed Gulls	11 Oystercatcher 9 Black-tailed Godwit 11 Redshank	10 Oystercatcher 39 Black-headed Gulls	6 Oystercatcher 77 Black-headed Gulls
Peak counts in 2009/10	51 Oystercatcher 1 Lapwing 14 Black-tailed Godwit 1 Curlew 4 Redshank 2 Black-headed Gulls	56 Oystercatcher 5 Redshank 22 Black-headed Gulls	16 Oystercatcher 280 Black-headed Gulls 1 Herring Gull 1 Lesser Black-backed Gull	9 Oystercatcher 140 Black-headed Gulls
Peak counts in 2008/09	29 Oystercatcher 74 Black-tailed Godwit 1 Curlew 13 Redshank	37 Oystercatcher 9 Black-headed Gulls	18 Oystercatcher	16 Oystercatcher 11 Black-headed Gulls
Peak counts in 2007/08	15 Oystercatcher 5 Black-tailed Godwit 5 Redshank	71 Oystercatcher 31 Black-headed Gulls	41 Oystercatcher 24 Black-headed Gulls 3 Common Gulls	13 Oystercatcher 68 Black-headed Gulls

Table 4. Waterbird species other than geese recorded on grasslands in the Ringsend area between November 2014 and April 2015. Peak counts of each species, in each site, are bold-faced. Blank cells indicate that no waterbirds were present when individual sites were checked.

All of the waterbird species using grasslands in the Ringsend area were recorded in small numbers, in comparison with the numbers recorded in intertidal habitats in Dublin Bay and South Dublin Bay (Tables 4 and 5).

	Peak count Dublin Bay *	Peak count South Dublin Bay *	Peak count Compensatory Grassland	Threshold for international importance
Oystercatcher	3,074	1,546	44	8,200
Black-tailed Godwit	1,362	222	3	610
Curlew	932	105	1	8,400
Redshank	2,077	508	2	3,900
Black-headed Gull	2,649	2,280	3	20,000

Table 5. Peak counts of waterbird species recorded on the compensatory grassland during the monitoring programme in 2014/15, compared with I-WeBS peak counts in Dublin Bay and South Dublin Bay in 2013/13.

* Data were supplied by the Irish Wetland Bird Survey (I-WeBS), a joint scheme of BirdWatch Ireland and the National Parks and Wildlife Service of the Department of Arts, Heritage & the Gaeltacht. I-WeBS data for 2014/15 are not available yet for comparison.

5. GOOSE USE OF GRASSLANDS

Light-bellied Brent Goose use of the grasslands as indicated by the density of droppings/m² provides a more reliable index of overall feeding use than direct counts of birds. Monitoring of dropping density along transects commenced on 26th November 2014, and continued through the winter of 2014/15 until 10th April 2015. The winter of 2014/15 was generally mild, there were no periods of snow cover on the grasslands, unlike the winter of 2010/11 when snow cover extended for some 25 days.

Average goose use of all monitored grasslands during the monitoring programme is shown in Table 6 and Figure 4. Use of the compensatory grassland was higher in 2014/15 than in the previous four seasons, and also higher than the monitoring programme average use for this site (Table 7).

Grassland area	Transect	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15
Compensatory Grassland	All transects	0.66	3.14	6.18	1.55	2.36	2.88	3.69	4.38
Sean Moore Park	East pitch	1.94	0.86	1.97	0.33	0.32	3.14	0.88	0.31
	West pitch	2.19	0.27	0.85	0.34	0.13	1.74	0.69	0.14
Irishtown Stadium		3.78	3.83	5.05	2.96	4.21	4.56	5.82	4.50
Ringsend Park		0.49	0.96	1.22	1.26	1.01	2.03	0.79	0.17

Table 6. Light-Bellied Brent goose grazing pressure (droppings/m²) averaged across all transects, in each winter season of the monitoring programme.

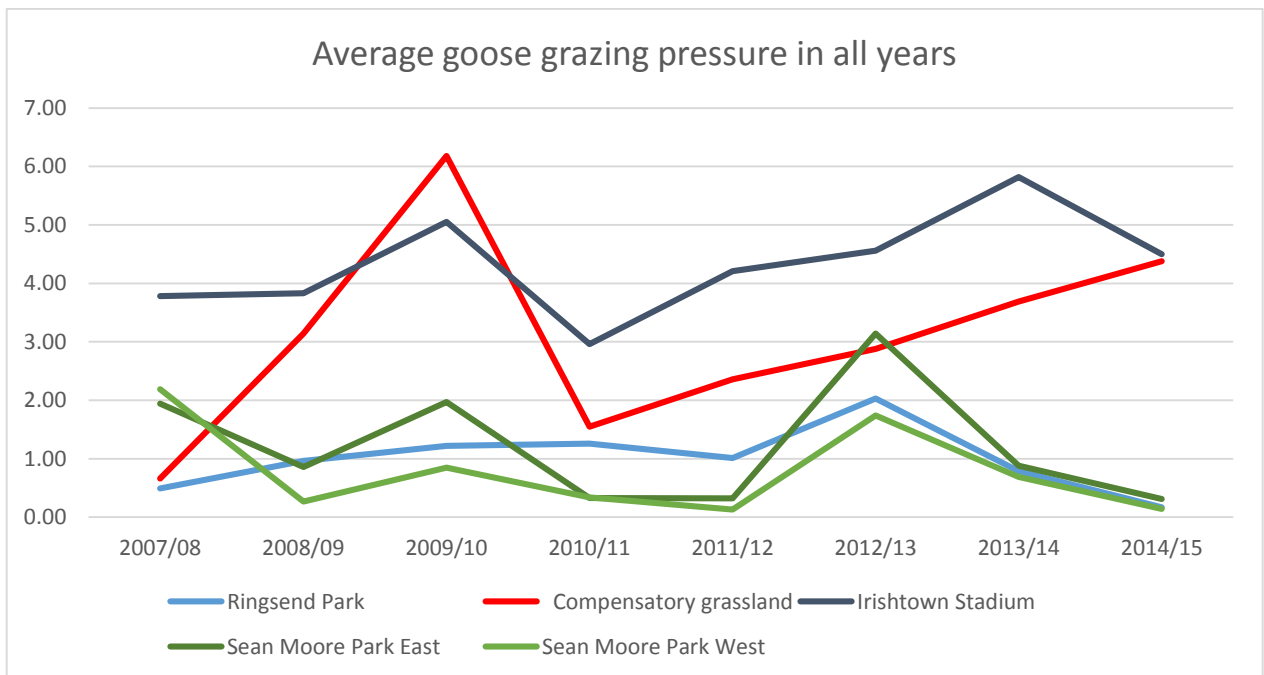


Figure 4. Light-Bellied Brent goose grazing pressure (droppings/m²) averaged across all transects, in each winter season of the monitoring programme.

Light-bellied Brent Goose overall grazing intensity has been higher in Irishtown Stadium than in the other monitored grasslands (compensatory grassland, Sean Moore Park and Ringsend Park) in the Ringsend area in seven of the last eight years (Table 6, Figure 4). In the years since management of the compensatory grassland was improved in 2008, the compensatory grassland and Irishtown Stadium have been the most intensively used of the monitored Ringsend grasslands. This is reflected in the mean dropping density averaged over all years of the monitoring programme: with an overall average of 4.46 goose droppings/m² in Irishtown Stadium, compared with a mean density of 3.11 droppings/m² in the compensatory grassland (Table 7). Excluding the winter season of 2007/08, mean grazing intensity was 3.45 droppings/m² on the compensatory grassland. In 2014/15, goose grazing intensity was very similar in both sites with a seasonal average of 4.5 droppings/m² on Irishtown Stadium, and 4.38 droppings/m² on the compensatory grassland. Use of individual transects is considered in section 5.1.

Grassland area	Transect	Mean density all years	Standard deviation
Compensatory Grassland	All transects	3.11	1.71
Sean Moore Park	East pitch	1.22	1.03
	West pitch	0.79	0.78
Irishtown Stadium		4.46	0.97
Ringsend Park		0.99	0.56

Table 7. Mean density of goose droppings/m² recorded on the Ringsend grasslands averaged over all years 2007/08, 2008/09, 2009/10, 2010/11, 2011/12, 2012/13, 2013/14, and 2014/15. Standard deviations are also given.

Sean Moore Park and Ringsend Park have been less intensively used by the geese during the monitoring programme to date (Tables 6 and 7, Figure 4).

5.1. Grazing intensity on individual transects

The mean density of goose droppings on all grassland transects on each survey date is given in Table 8, these data are presented graphically in Figure 5. Grazing intensity in the compensatory grassland transects averaged over the 2014/15 season varied from 2.09 on transect T10, to 6.44 on transect T1B (see Figure 2). Mean densities of goose droppings on all transects, averaged over each season of the monitoring programme, are given in Table 9, together with mean density since 2008, and are shown graphically in Figure 6 (page 17). These data indicate that goose grazing intensity was higher than average on 8 of the 9 transects on the compensatory grassland during 2014/15, and slightly lower than average on one of the compensatory grassland transects (T10). Goose grazing intensity was higher on four of the transects on the compensatory grassland than on Irishtown Stadium in 2014/15: T1A, T1B, T2A and T2B (see Figure 2).

Grassland area	Transect	26.11 2014	5.12 2014	15.12 2014	5.01 2015	28.01 2015	18.02 2015	6.03 2015	19.03 2015	10.04 2015	Season mean
Compensatory Grassland	T1A	1.62	5.79	7.70	6.59	4.55	5.13	6.08	5.11	1.42	4.89
	T1B	0.66	4.54	11.89	8.25	7.16	9.35	6.39	3.87	5.89	6.44
	T1C	0.03	0.91	5.89	6.86	5.42	3.95	2.81	1.32	5.73	3.66
	T2A	1.09	5.55	8.20	6.16	4.63	6.24	6.46	6.05	4.45	5.43
	T2B	0.11	3.64	8.89	4.66	6.18	8.70	7.78	6.71	7.33	6.00
	T2C	0	2.12	5.54	3.66	4.13	4.52	5.28	4.41	3.99	3.74
	T10	0	5.38	4.18	1.34	1.49	2.50	1.90	1.78	0.26	2.09
	T30	0.81	4.1	5.36	3.36	2.89	3.71	4.07	3.31	1.92	3.28
T60	1.6	4.77	6.20	3.44	2.32	4.69	4.39	4.38	2.98	3.86	
Sean Moore Park	East pitch	0	0	0	0.83	0	0.09	1.06	0.84	0	0.31
	West pitch	0	0	0.01	0.13	0.05	0.006	0.53	0.49	0	0.14
Irishtown Stadium		0.42	2.15	3.94	7.23	5.29	3.98	5.10	8.49	3.88	4.50
Ringsend Park		0	0	0	0.18	0.04	0.24	0.31	0.71	0.04	0.17

Table 8. Mean density of goose droppings/m² recorded on all transects on each survey date in winter 2014/15, and average density on each transect throughout the winter season (Season mean).

Grassland area	Transect	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	Mean 2008/09 to 2014/15	Standard deviation 08/09 – 14/15
Compensatory Grassland	T1A	0.04	2.39	6.19	1.90	2.44	3.20	4.73	4.89	3.68	1.61
	T1B	0.09	2.04	5.54	1.55	2.27	4.67	5.76	6.44	4.04	2.03
	T1C	0.02	0.63	4.49	0.89	0.54	4.00	1.46	3.66	2.24	1.74
	T2A	2.14	5.55	6.84	1.70	4.27	2.54	4.34	5.43	4.38	1.78
	T2B	0.80	6.14	9.63	1.88	2.65	4.38	4.29	6.00	5.00	2.58
	T2C	0.05	2.01	5.73	1.75	1.73	2.92	3.06	3.74	2.99	1.42
	T10	0.49	3.27	5.26	1.45	2.21	1.04	2.12	2.09	2.49	1.40
	T30	1.09	2.52	5.52	1.52	2.69	1.63	3.84	3.28	3.00	1.39
T60	1.24	3.69	6.39	1.29	2.45	1.55	3.62	3.86	2.84	1.07	
Sean Moore Park	East pitch	1.94	0.86	1.97	0.33	0.32	3.14	0.88	0.31	1.12	1.07
	West pitch	2.19	0.27	0.85	0.34	0.13	1.74	0.69	0.14	0.59	0.57
Irishtown Stadium		3.78	3.83	5.05	2.96	4.21	4.56	5.82	4.50	4.42	0.90
Ringsend Park		0.49	0.96	1.22	1.26	1.01	2.03	0.79	0.17	1.06	0.56

Table 9. Mean density of goose droppings/m² recorded on all transects in 2007/08, 2008/09, 2009/10, 2010/11, 2011/12, 2012/13, 2013/14, and 2014/15. Means and standard deviations for all years from 2008/09 to 2014/15 are also given.

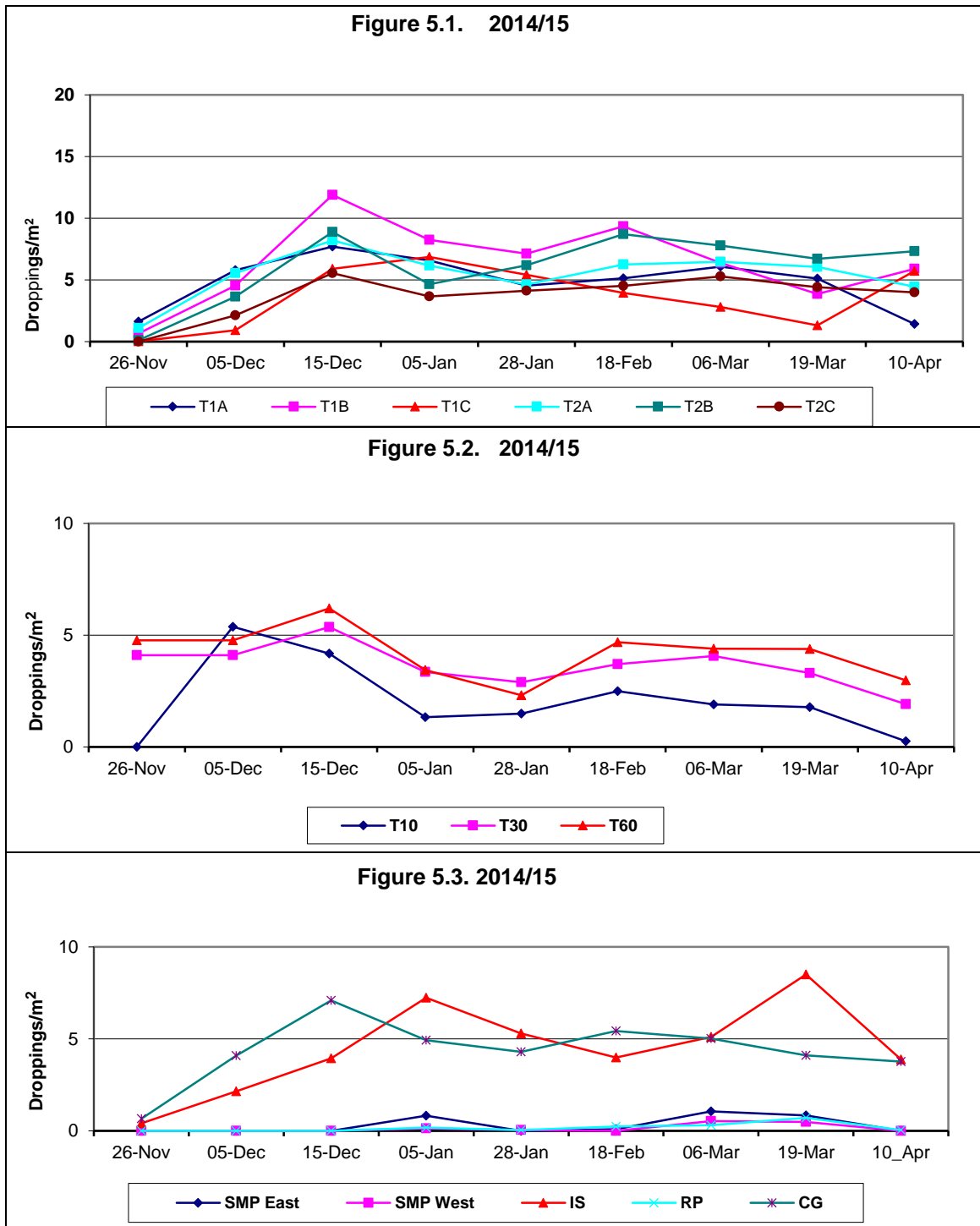


Figure 5. Mean density of goose droppings/m² recorded on compensatory grassland transects (4.1) 1 and 2, (4.2) 10, 30 and 60, and (4.3) a comparison of the Compensatory Grassland (CG) with the other grasslands in the Ringsend area, in 2014/15.

6. SUMMARY OF WATERBIRD USE OF THE COMPENSATORY GRASSLAND.

The Project Agreement was signed on Friday 19th September 2014. Site clearance and setup commenced in October. Piling works at the approved project site, using Continuous Augered Piles (CFA Piles), commenced during the week starting 20th October, initially with one piling rig and subsequently with three rigs. Piling and foundation works continued through the winter season. Construction of above ground structures commenced in March 2015.

Light-bellied Brent Geese were first recorded feeding in intertidal habitats in South Dublin Bay on 20th September 2014, when 15 birds were observed feeding on the *Zostera* bed near Merrion Gates. There was a high standing crop of green macroalgae in intertidal habitats in Dublin Bay during the autumn of 2014, related to prolonged warm sunny weather. Brent geese continued to feed on green macroalgae in December, with 225 birds feeding to the south of the Poolbeg peninsula on 15th December.

Brent Geese started to feed on the compensatory grassland in late November 2014, and a peak count of 331 was recorded on 5th December 2014. Feeding use had been recorded on all transects by 5th December. Use of the compensatory grassland was higher in 2014/15 than in the previous four seasons, and also higher than the monitoring programme average use of this site.

In the years since management of the compensatory grassland was improved in 2008, the compensatory grassland and Irishtown Stadium have been the most intensively used of the monitored Ringsend grasslands. Goose grazing intensity was higher than average on 8 of the 9 transects on the compensatory grassland during 2014/15, and slightly lower than average on one of the compensatory grassland transects (T10). Goose grazing intensity was higher on four of the transects on the compensatory grassland than on Irishtown Stadium in 2014/15.

All of the waterbird species recorded on the compensatory grassland make feeding use of grassland habitats as well as intertidal habitats. Redshank, Curlew and Black-tailed Godwit generally use wet grassland, or temporarily flooded grassland which does occur within the compensatory grassland. Oystercatchers use dry grasslands as well as wet grasslands.

7. REFERENCES

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The Irish Wetland Bird Survey (I-WeBS) is a joint scheme of BirdWatch Ireland and the National Parks and Wildlife Service of the Department of Arts, Heritage & the Gaeltacht.

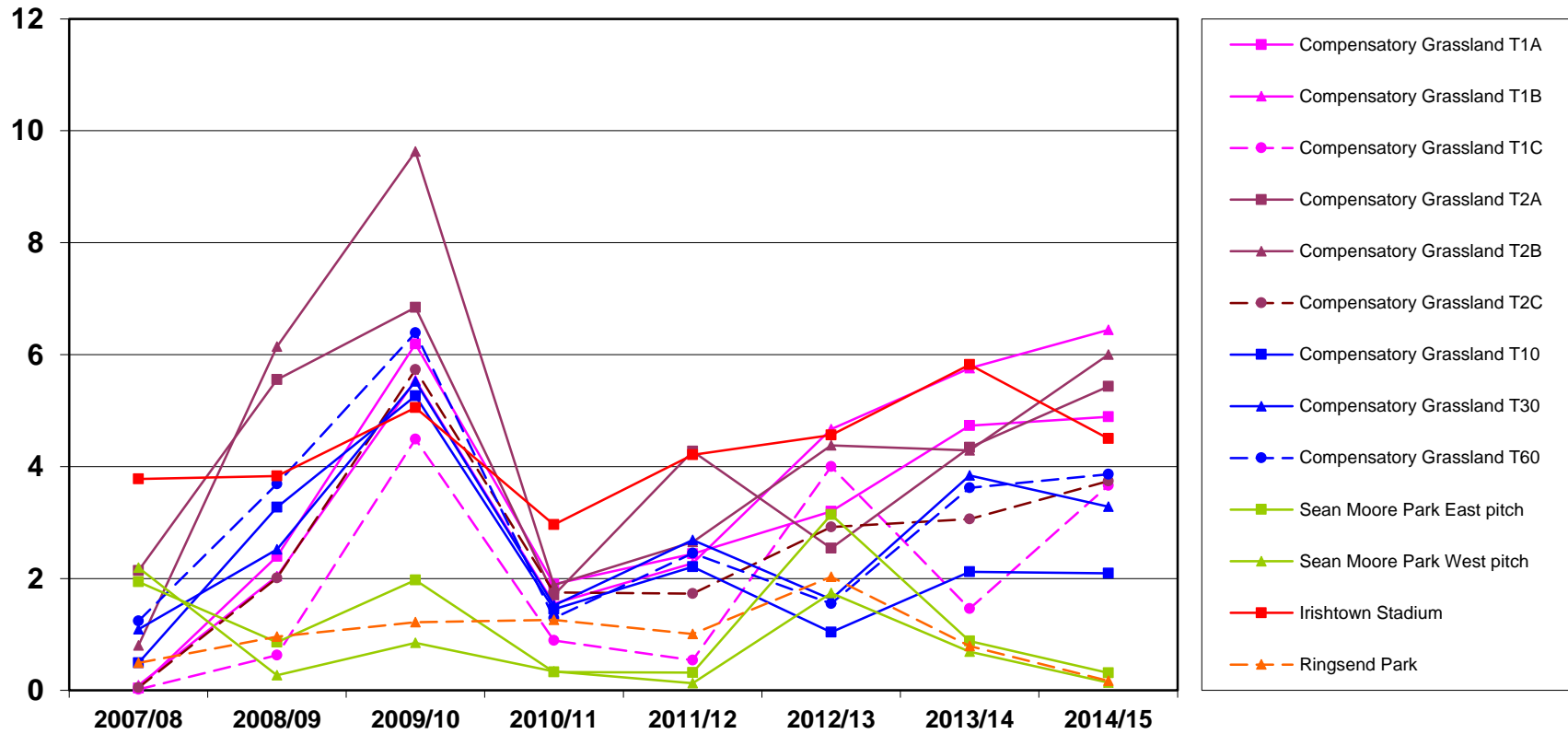


Figure 6. Mean density of goose droppings/m² recorded on the transects in 2007/08, 2008/09, 2009/10, 2010/11, 2011/12, 2012/13, 2013/14 and 2014/15.

Note: data are averaged for each transect across all survey dates in each season.