

An aerial survey of harbour seals in Ireland:

Part 1 - Lough Foyle to Galway Bay

August 2011

A Report for the National Parks & Wildlife Service of the Department of Arts,
Heritage and the Gaeltacht (DAHG)

Contract Titles:

1. Aerial thermal imaging survey for harbour seals (2011)
2. Analysis of seal data from August 2011 aerial survey (2012)

This report summarises the results of an aerial survey of harbour seals carried out in August 2011. The aerial survey and analysis detailed in this report were conducted by the Sea Mammal Research Unit, University of St Andrews with funding from the National Parks & Wildlife Service (NPWS), Department of Arts, Heritage and the Gaeltacht, Dublin.

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Summary

In August 2011 the Sea Mammal Research Unit (SMRU) of the University of St Andrews carried out an aerial survey of moulting harbour seals (*Phoca vitulina*, also known as common seals) in the north and north-west of Ireland, between Lough Foyle and Galway Bay. A previous nationwide aerial survey took place in Ireland in 2003 (Cronin *et al.*, 2004, 2007). Although the main aim of the 2011 survey was to count harbour seals hauled out ashore, grey seals (*Halichoerus grypus*), where encountered, were also counted as part of the survey. The greater part of the Co. Galway coast was surveyed in 2011. To economise on survey time, three small island groups off the Connemara coast (Mile Rocks, The Skerd Rocks and The Ferrooms) were not surveyed. Being more offshore, these islands are more likely to be home to grey seals than harbour seals. The remainder, from Galway Bay (including the Aran Islands) to Carlingford Lough was surveyed in 2012 using the same methodology (Duck & Morris, 2012).

Improved survey techniques first employed in Scotland in 2007, resulted in more accurate species identification and, consequently, final numbers compared with the 2003 survey. This should be kept in mind when interpreting any differences in counts between the 2003 and 2011 surveys.

In Co. Donegal, Co. Sligo, Co. Mayo and part of Co. Galway (excluding the Aran Islands) **2,293** harbour seals were counted in August 2011 compared with **1,714** in August 2003. In other words, 33.8% more harbour seals were counted in 2011 than in 2003. Although not the target of the survey, 1,846 grey seals were also counted in 2011 compared with 681 in 2003. The 2011 grey seal count was 171.1% higher than the 2003 count. No seals of either species were recorded in Co. Leitrim.

While the 2011 harbour seal count for north and north-west Ireland was higher than the comparable 2003 count, the locations of haul-out sites were similar. Numbers of harbour seals appeared to be broadly similar to comparable areas around Scotland. Grey seal numbers in 2011 were significantly higher than in 2003 but remain low compared with several areas in the UK. Grey seal counts in the Outer Hebrides, for instance, were 3,064, 3,407 and 2,518 in 2003, 2008 and 2011 respectively. It is important not to over-emphasise the difference between the 2003 and the 2011 grey seal counts as grey seal haul-out counts can be far more variable than harbour seal counts during the summer months.

Compared with different areas of Scotland, the overall numbers of grey seals in the north and north-west of Ireland appear to be relatively low, considering the abundance of haul-out sites and apparently suitable habitat along the Irish coast.

Introduction

This report summarises the results from a survey of harbour seals (*Phoca vitulina*, also known as common seals) in the north and north-west of Ireland from Lough Foyle to Galway Bay. Data collected on grey seals (*Halichoerus grypus*) is also presented, although it should be borne in mind that this seal was not the target of the survey. Both seal species are included in Annex II of the European Union's Directive 92/43/EEC, commonly known as the Habitats Directive. The Directive's aim is to encourage the maintenance of biodiversity through the conservation of natural habitats and wild fauna and flora in the territories of European Union member states.

The Sea Mammal Research Unit (SMRU) undertakes routine surveys of harbour seals and grey seals around Scotland and part of England. SMRU was previously involved in surveying seals in Ireland in August 2003 in a collaborative project funded by the National Parks & Wildlife Service (NPWS; Cronin *et al.*, 2004, 2007). The 2003 aerial survey was the first complete census of harbour seals around Ireland's coastline. Nationwide surveys targeting grey seals were subsequently conducted in 2005 (Ó Cadhla *et al.*, 2008) and 2007 (Ó Cadhla & Strong, 2007). National monitoring of both species continues to the present day (see www.npws.ie/marine/marinemammals).

In Ireland and the UK, harbour seal population surveys are carried out during the species' annual moult which occurs between July and September. Grey seals hauled ashore are also counted during these surveys, providing additional information on their summer distribution, although grey seal numbers can be highly variable from day to day during the summer months.

Since 2007, high resolution digital still photographs taken of most groups of harbour and grey seals have been used to confirm or correct numbers and species identity of groups of seals located using thermal imagery.

Methods

The Sea Mammal Research Unit (SMRU) carried out surveys of harbour seals by helicopter using a thermal imaging camera, following the standard SMRU survey protocol:

- Surveys were restricted to within two hours either side of low tides occurring between approximately 12:30 and 19:30.
- Surveys were restricted to the harbour seal moult season.
- There was no surveying on days with moderate or persistent rainfall.
- The footage obtained by the thermal imaging camera was recorded to a digital video recorder for desktop reviewing and recounting of haul-out groups on a PC at the Scottish Oceans Institute in St Andrews, UK.
- High resolution digital still photographs were taken of most groups of harbour seals and grey seals recorded ashore, in order to improve the accuracy of counts and to confirm species identification.
- A detailed track of each day's progress was recorded on a GPS unit. This enabled the placement of capture locations for the high-resolution digital images onto the survey track. Combining this with an accurate low-water GIS map of Ireland and viewing detailed satellite imagery of the Irish coast, enabled accurate positioning of all groups of seals encountered.

Results and Discussion

Following completion of an equivalent aerial survey of Northern Ireland, the entire coastline of Counties Donegal, Leitrim, Sligo and Mayo was surveyed between the 14th August and the 18th August 2011. County Galway was surveyed on 18th and 20th August. Due to the fixed budget

allocation the Galway/North Clare region could not be completed in its entirety and, in consultation with NPWS, the decision was made to exclude three small offshore island groups west of Mason Island and Gorumna Island off the Connemara coast (i.e. Mile Rocks, The Skerd Rocks and The Ferroons), parts of the mainland in southern Galway Bay, and the Aran Islands. Daily survey segments covered in August 2011 are shown in Figure 1. No survey was carried out on 19th August due to the helicopter pilot's mandatory rest day. Fortunately, this coincided with a day of heavy rain and strong westerly winds which would have made surveying impossible (Table 1).

The Irish coast was subdivided into regions (the same as counties) and smaller subregions so that counts may be examined at a more local level. Regions and subregions are shown in Figure 2 and are outlined in Figures 3a and 4a. Counts of harbour seals within surveyed regions and subregions are in Table 2, including adjusted regional counts from Cronin *et al.* (2007). Counts of grey seals are in Table 3.

In the comparable areas of Co. Donegal, Co. Sligo, Co. Mayo and part of Co. Galway surveyed, a total of **2,293** harbour seals were counted in August 2011 compared with **1,714** in 2003 (derived from Appendix 1 in Cronin *et al.* 2004). The count in 2011 was 33.8% higher than that recorded in 2003 by Cronin *et al.* (2004, 2007). The main concentrations of harbour seals were in Mulroy Bay, Rutland Island-Dunglow, Gweebarra Bay, Inner Donegal Bay, Ballysadare Bay, Killala Bay, Clew Bay, the south coast of Connemara and Galway Bay, similar to those found in 2003. Figures 3a (actual haul-out sites) and 3b (aggregated by 10km squares) show the distribution of harbour seals in the north and north-west of Ireland in August 2011. For comparison, Figure 3c shows the harbour seal distribution recorded in August 2003 (aggregated by 10km squares). In August 2011, parts of the Black Head subregion (Co. Clare) on the south side of Galway Bay were also surveyed. A total of 167 harbour seals were counted in part of Co. Clare in 2011, more than in the entire Co. Clare 2003 total of 142. This area has been excluded from the numbers and Tables in this report as the entire Co. Clare was resurveyed in September 2012 (Duck & Morris, 2012).

In August 2011, 1,846 grey seals were counted compared with 681 counted in 2003 (derived from Appendix 3 in Cronin *et al.* 2004), an overall figure that is 171.1% higher than that recorded in 2003. While the difference between the 2011 and 2003 counts may appear dramatic, the actual number of grey seals counted in 2011 is considered to be surprisingly low given the extent of suitable and available habitat. Grey seal haul-out counts during the summer can be highly variable and care should be taken not to misinterpret or over-emphasise this difference. The apparent change in numbers recorded ashore in August 2011 is also put into perspective by haul-out count data reported by Ó Cadhla & Strong (2007). During the grey seal moulting season in March 2007, 1,882 grey seals were counted among the Inishkea Island group (Co. Mayo) alone. Interestingly, the distribution of grey seals haul-outs in 2011 (Figure 4a, actual haul-out sites and 4b, aggregated by 10km squares) was very similar to that recorded in August 2003 (Figure 4c, aggregated by 10km) although numbers at many haul-out sites were greater in 2011.

A comparison of the numbers of harbour seals counted in regions (counties) of the north and north-west of Ireland in 2003 and 2011 is shown in Figure 5a. Figure 5b shows the proportion of the 2003 and 2011 harbour seal totals in each region. Similarly, a comparison of the numbers of grey seals counted in regions (counties) of the north and north-west of Ireland in 2003 and 2011 is shown in Figure 6a. Figure 6b shows the proportion of the 2003 and 2011 grey seal totals, in each region.

Acknowledgments

The surveys would not have been possible without the help and support of: PDG Helicopters, pilot Karl Franz and ground crew Jonny Davidson. Richard Fitch of Horton Levi provided and supported the Barr and Stroud IR18 thermal imaging camera. Claire Brett drove around North and West Ireland, carrying our support equipment and arranging overnight accommodation. Oliver Ó Cadhla

(Department of Arts, Heritage and the Gaeltacht) kept us on the right lines during the survey, was indefatigably enthusiastic throughout all the planning and operational stages and liaised with NPWS ground-counting teams. Eamonn Kelly of the Department of Arts, Heritage & the Gaeltacht (DAHG) smoothed any waters before they ever became troubled. Thank you all, for making the survey as worthwhile and as productive as it could be.

References

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Ó Cadhla, O., Strong, D., O'Keeffe, C., Coleman, M., Cronin, M., Duck, C., Murray, T., Dower, P., Nairn, R., Murphy, P., Smiddy, P., Saich, C., Lyons, D. & Hiby, A.R. 2008. An assessment of the breeding population of grey seals in the Republic of Ireland, 2005. *Irish Wildlife Manuals* No. 34. National Parks & Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin, Ireland. 60pp.

Figure 1. Map of the extent of coastline surveyed each day during the August 2011 harbour seal survey. More detailed information is provided in Table 1.



Figure 2. Regions (counties, in green text) and subregions around Ireland as defined by SMRU. Counts of harbour seals and grey seals in each subregion are provided in Tables 2 and 3 respectively.

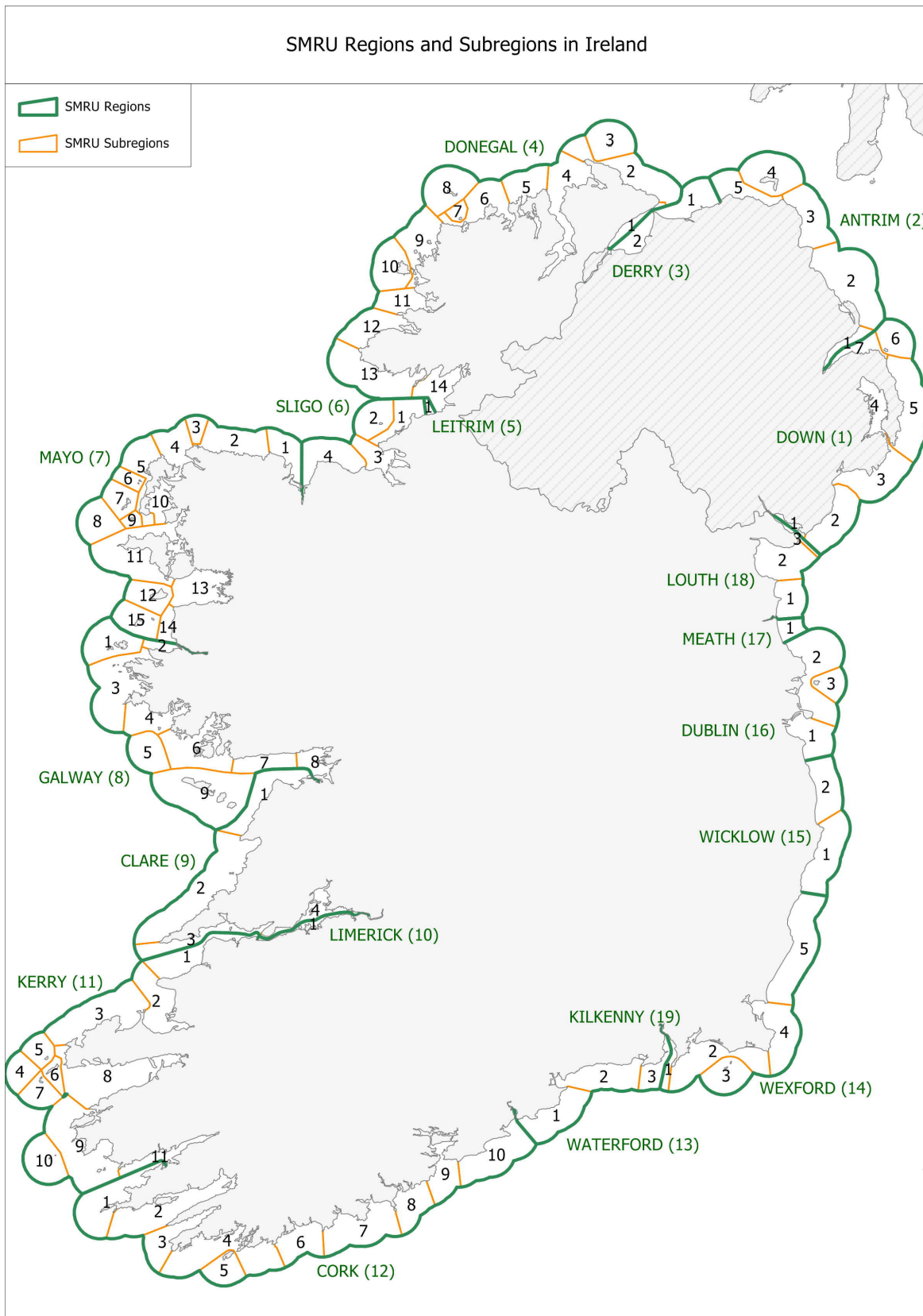


Figure 3a. The number and distribution of harbour seals in the north and north-west of Ireland in August 2011. Regions and subregions, as defined by SMRU and detailed in Figure 2 and Table 2, are also shown. Figure 3b shows harbour seal distribution at a 10km resolution. Data were collected by the Sea Mammal Research Unit, University of St Andrews for the Department of Arts, Heritage and the Gaeltacht.

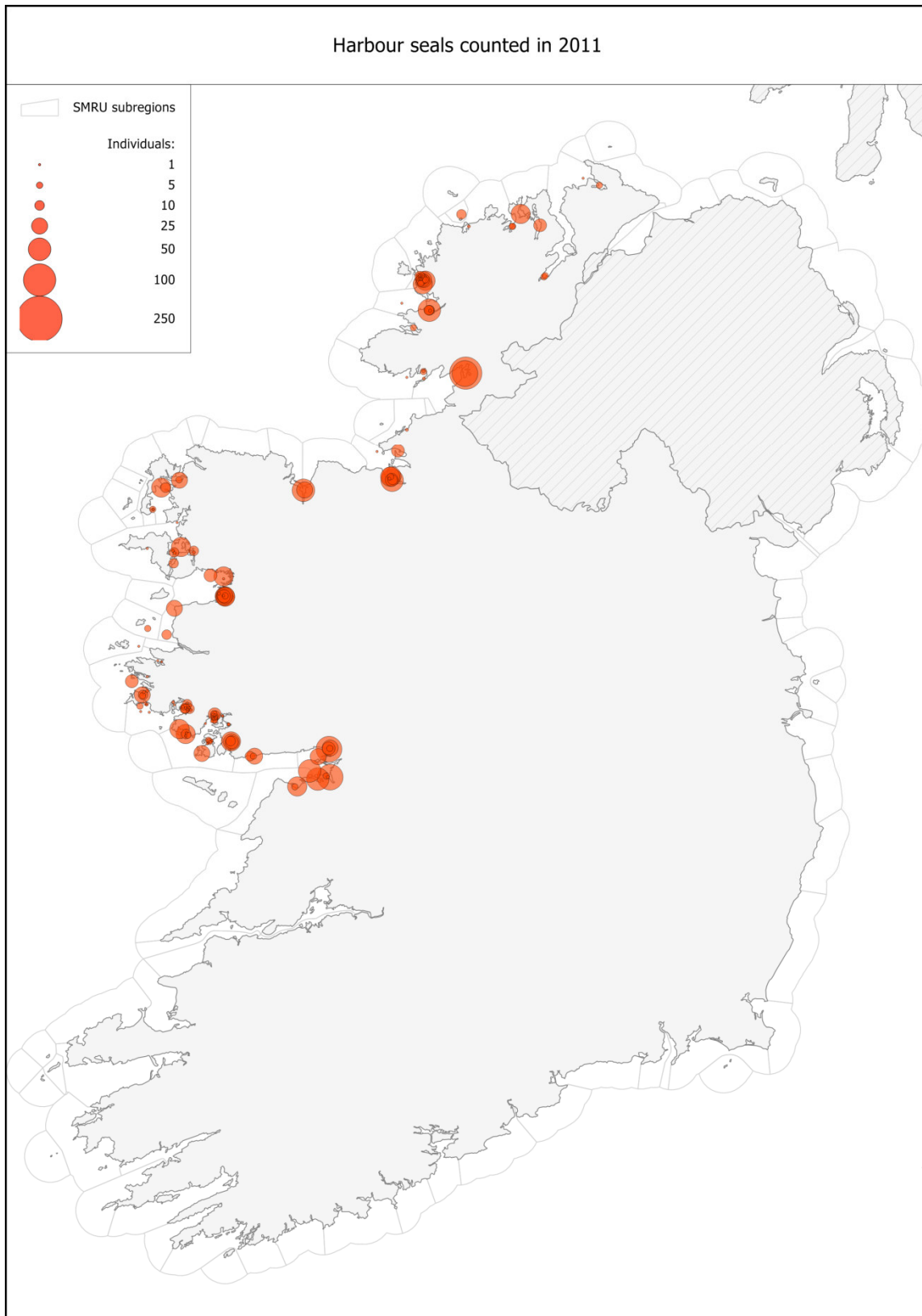


Figure 3b. This map shows the same harbour seal data in the north and north-west of Ireland as Figure 3a but counts are aggregated by 10km squares (background grid). Data were collected by the Sea Mammal Research Unit, University of St Andrews for the Department of Arts, Heritage and the Gaeltacht.

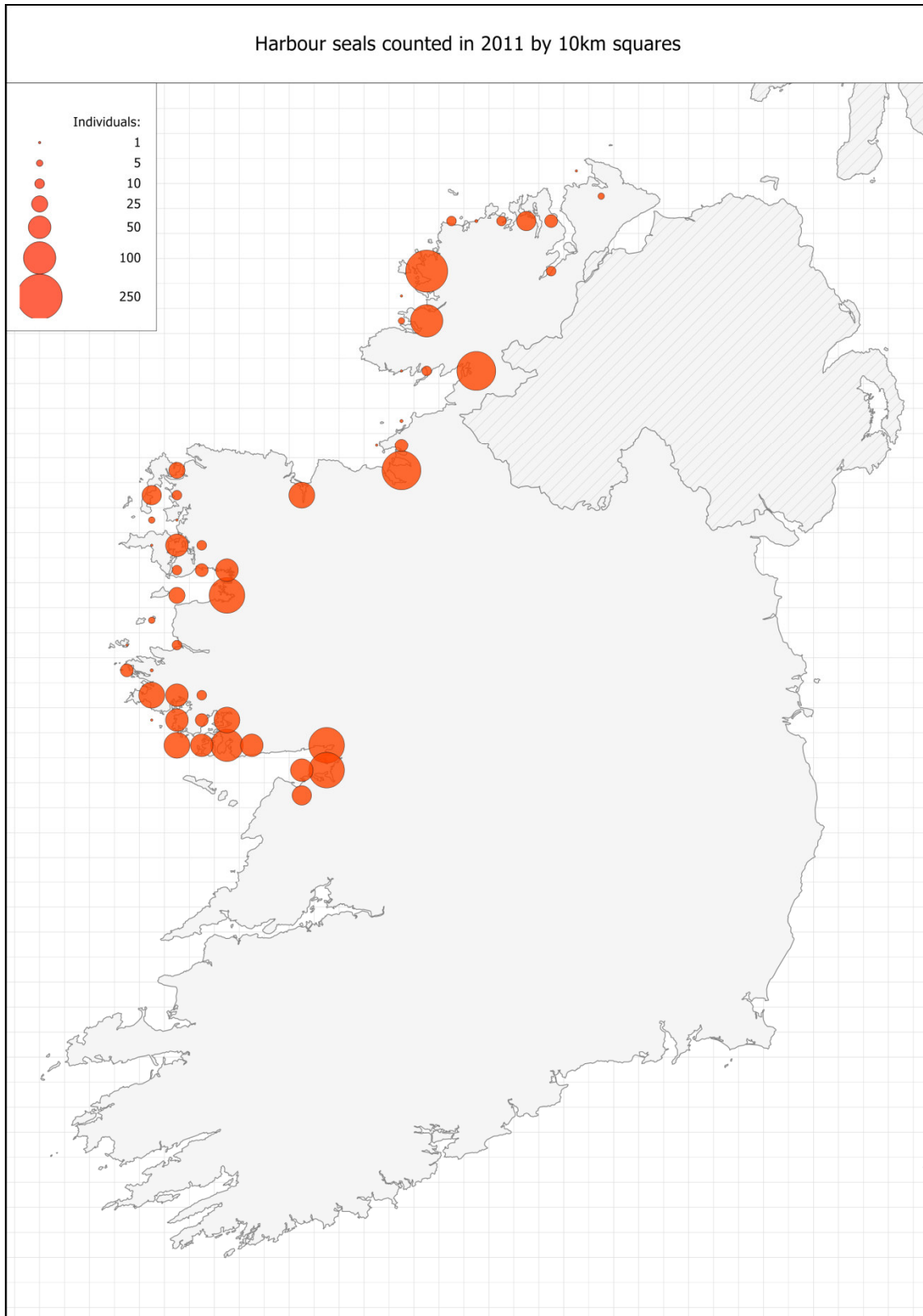


Figure 3c. Harbour seal distribution in Ireland in August 2003, with counts aggregated by 10km squares. This figure is included for comparison with the 2011 data. Data were collected by the Sea Mammal Research Unit, University of St Andrews and Coastal and Marine Resources Centre, University College Cork for the Department of the Environment, Heritage and Local Government.

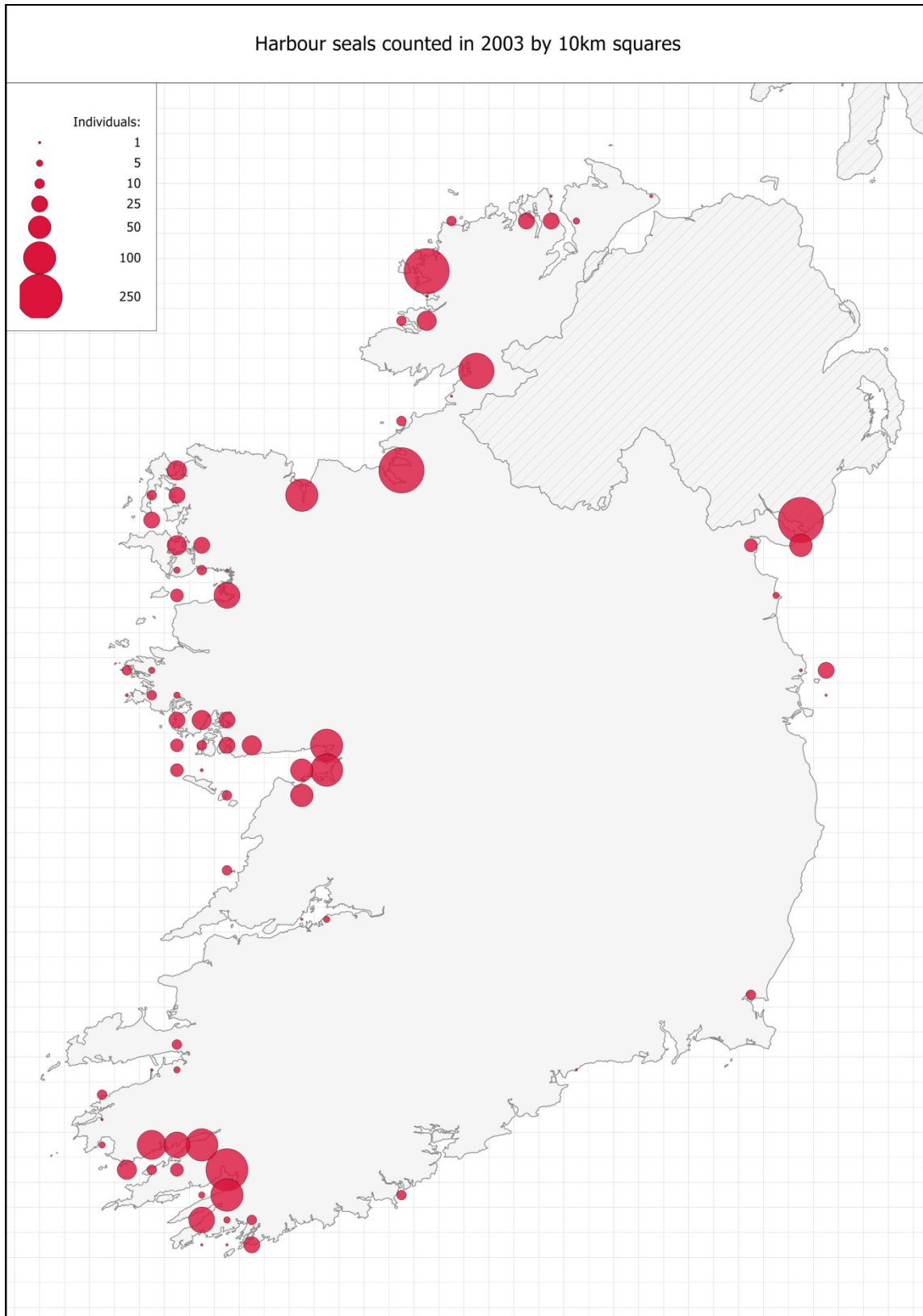


Figure 4a. The number and distribution of grey seals in the north and north-west of Ireland in August 2011. Regions and subregions as defined by SMRU and detailed in Figure 2 and Table 3 are also shown. Figure 4b shows the same data at a 10km resolution. Data were collected by the Sea Mammal Research Unit, University of St Andrews for the Department of Arts, Heritage and the Gaeltacht.

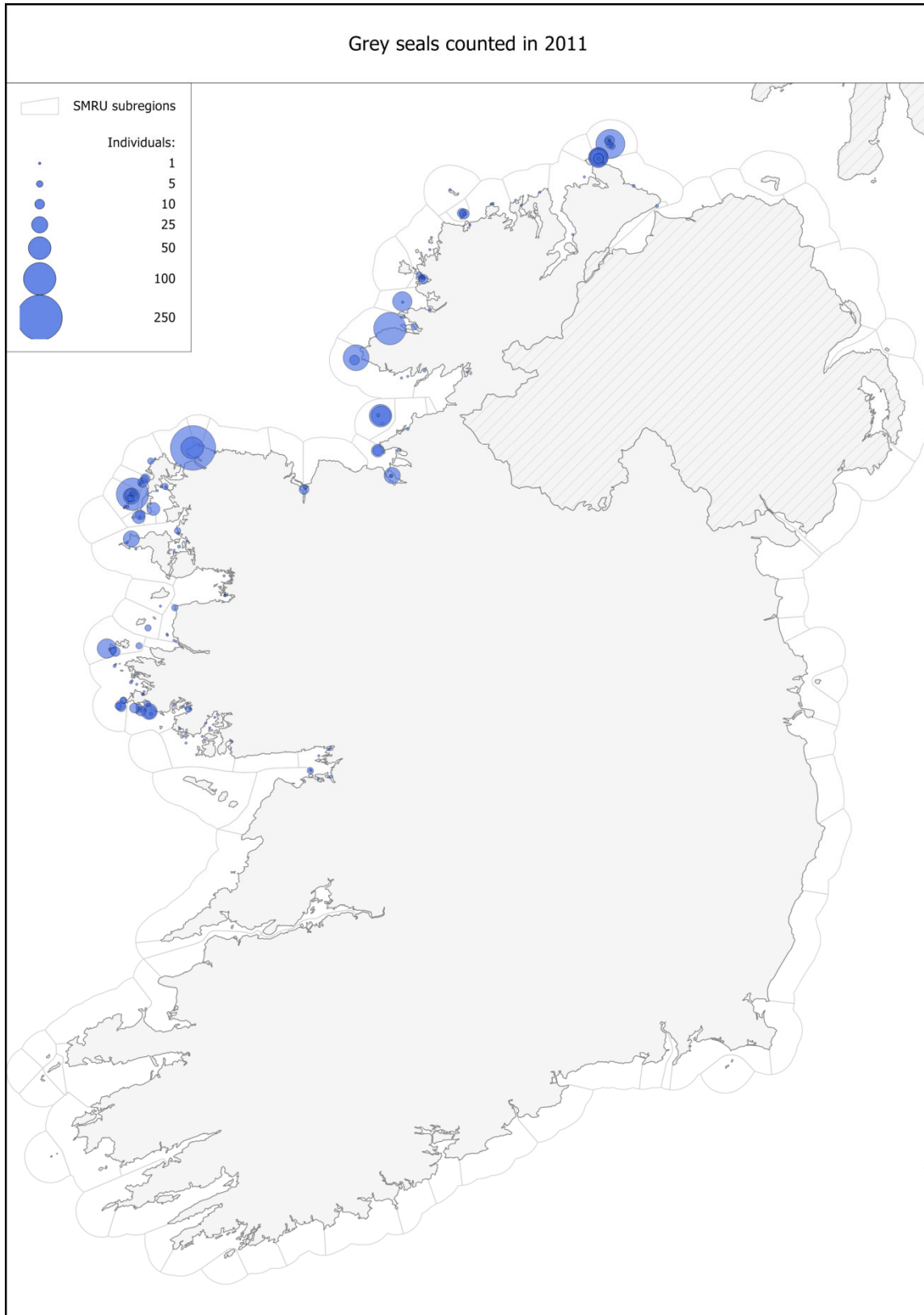


Figure 4b. This map shows the same grey seal data in the north and north-west of Ireland as in Figure 4a but counts are aggregated by 10km squares (background grid). Data were collected by the Sea Mammal Research Unit, University of St Andrews for the Department of Arts, Heritage and the Gaeltacht.

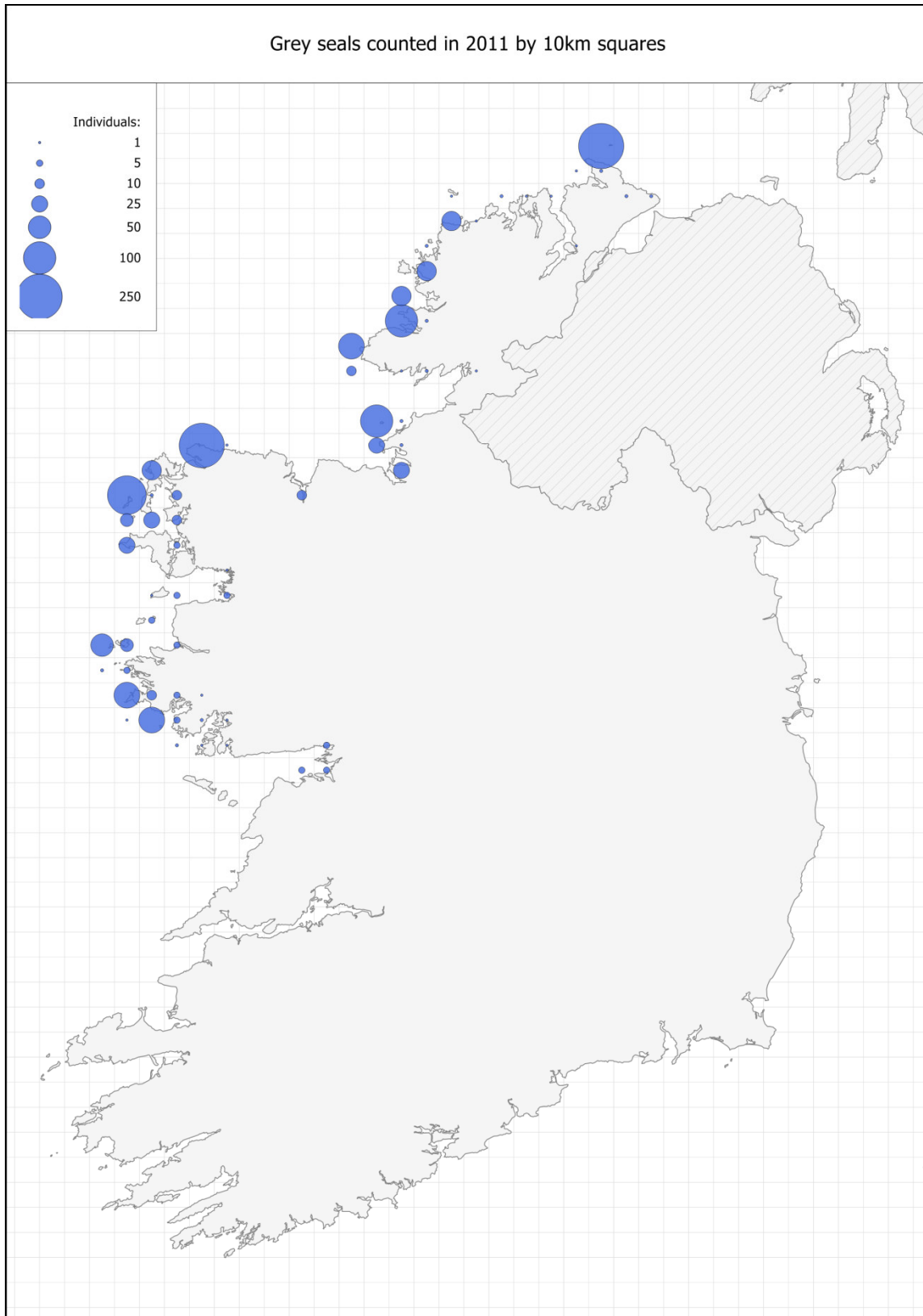


Figure 4c. Grey seal distribution in Ireland in August 2003, with counts aggregated by 10km squares (background grid). This figure is included for comparison with the 2011 data. Data were collected by the Sea Mammal Research Unit, University of St Andrews and Coastal and Marine Resources Centre, University College Cork for the Department of the Environment, Heritage and Local Government.

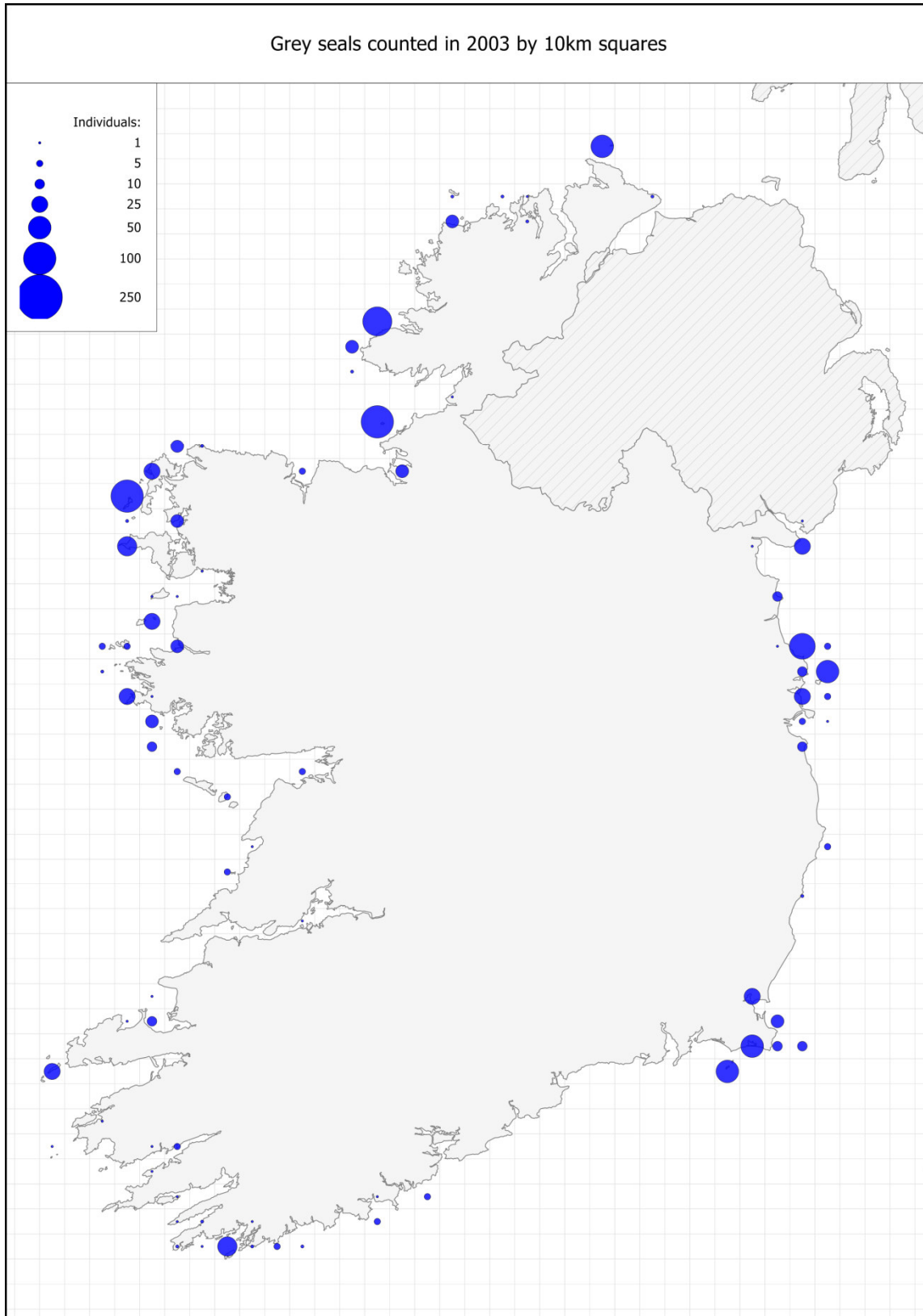
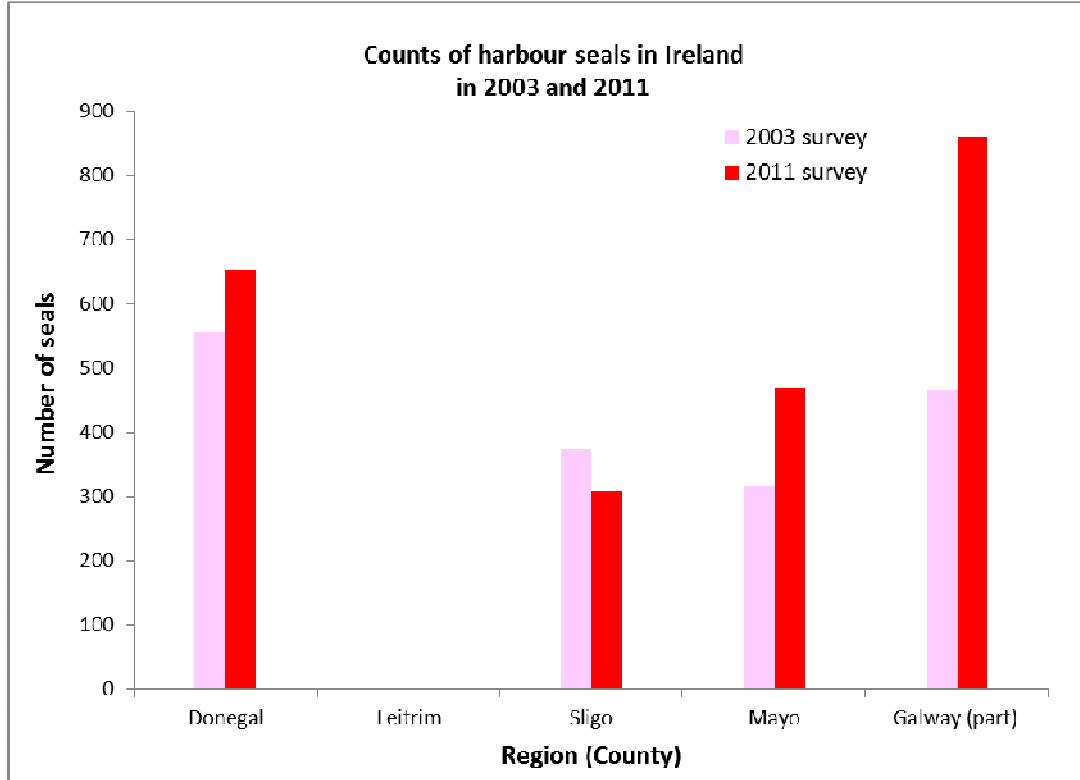


Figure 5. Numbers and proportions of harbour seals counted in regions (i.e. counties) of the north and north-west of Ireland in August 2011, compared with numbers counted in a previous survey in August 2003 (Cronin *et al.* 2004).

(a) Actual counts



(b) Proportion of 2011 total

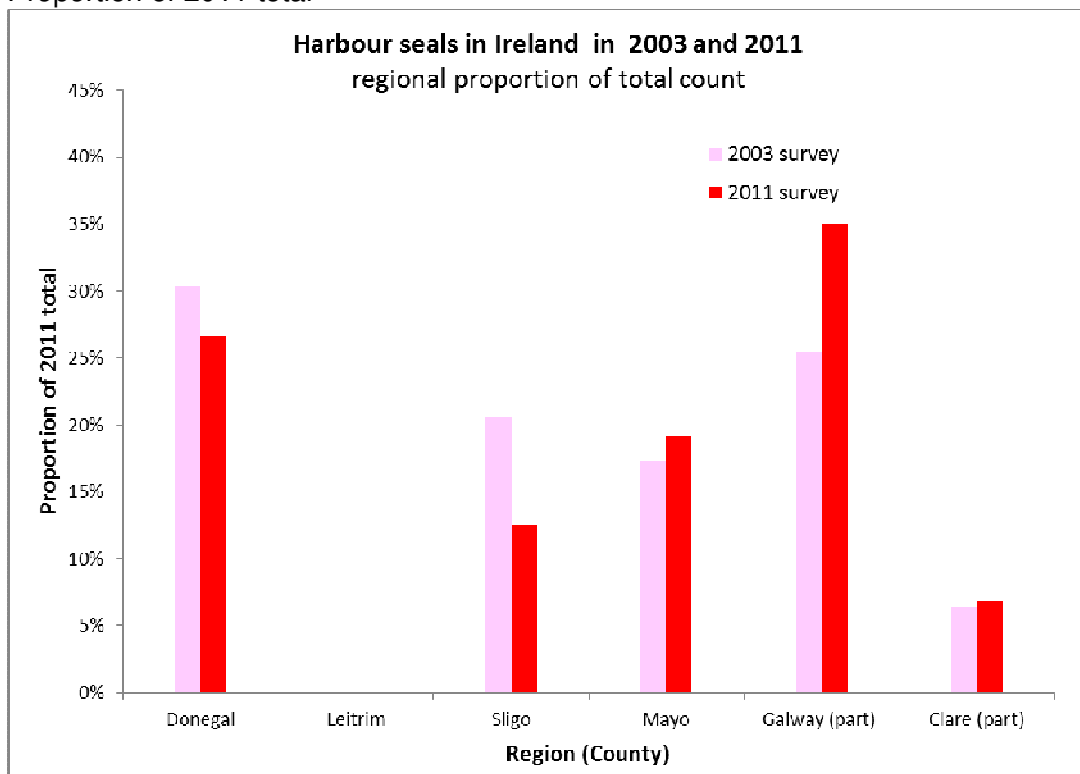
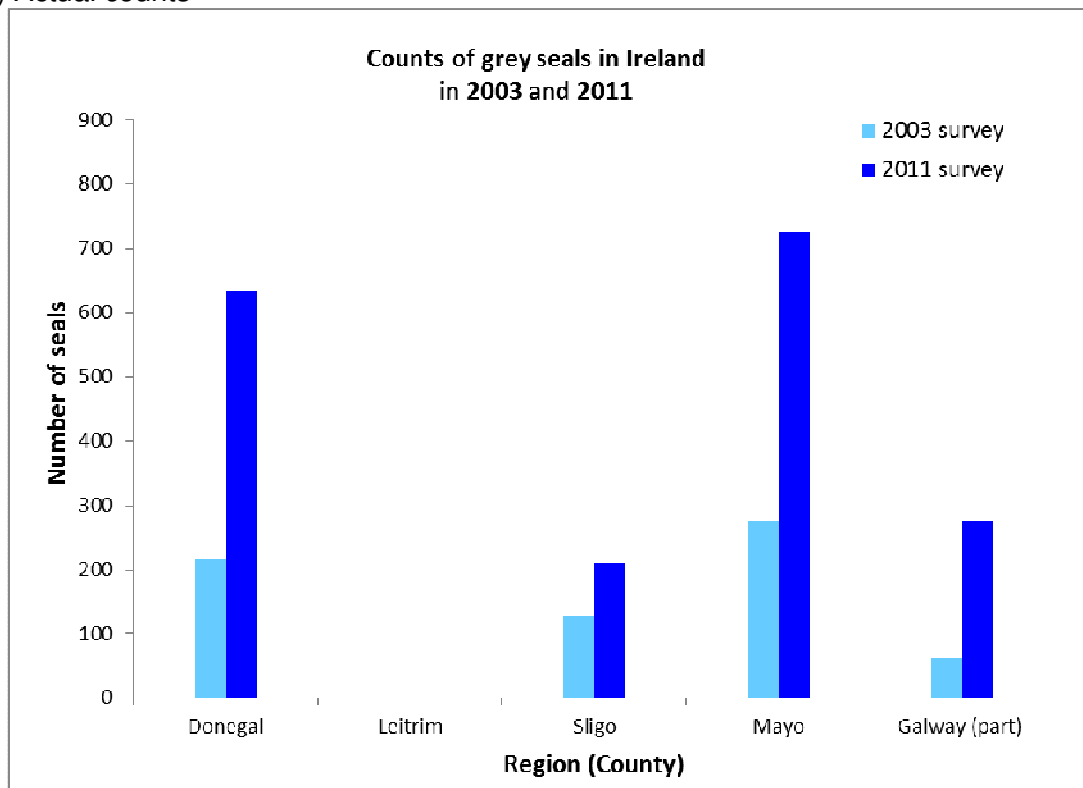


Figure 6. Numbers of grey seals counted in regions (i.e. counties) of the north and north-west of Ireland in August 2011, compared with numbers counted in a previous survey in August 2003 (Cronin *et al.* 2004).

(a) Actual counts



(b) Proportion of 2011 total

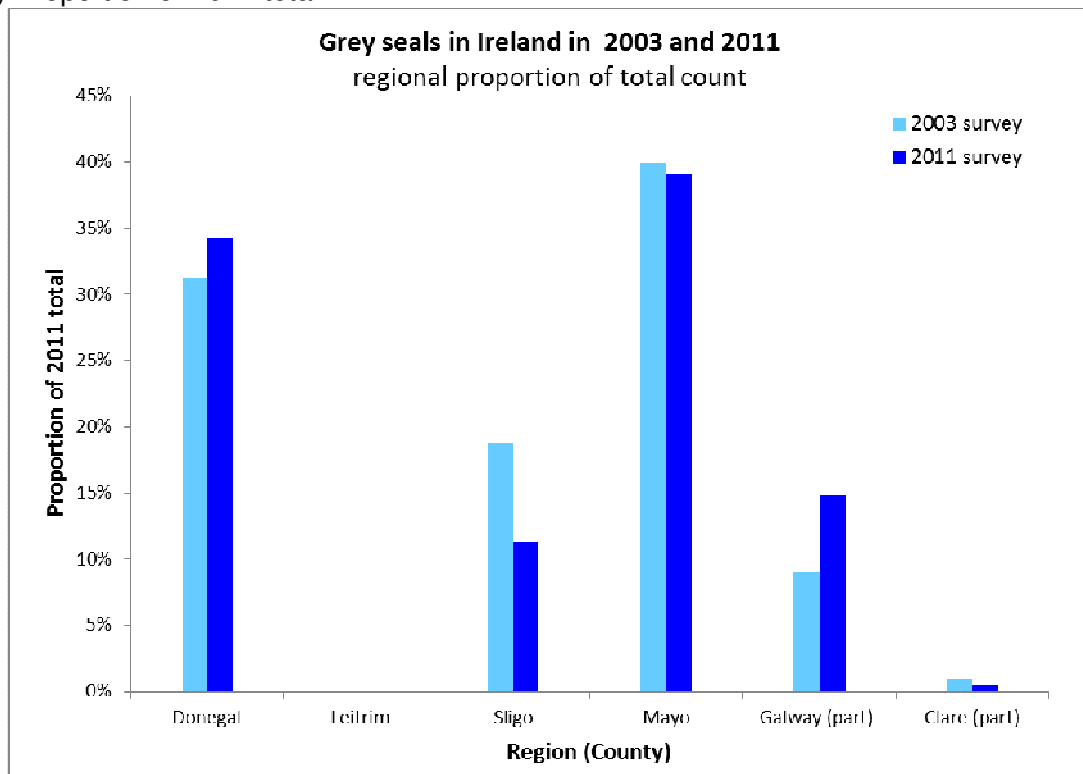


Table 1. Calendar of the August 2011 survey showing the areas covered and associated environmental information.

Date		Area covered	Conditions	Comments
Sun	14/08/2011	Lough Foyle to Lough Swilly (opposite Buncrana).	WW 4 Hot at start, occasional light showers later. N coast very hot.	
Mon	15/08/2011	NE end of Lough Swilly to Portnoo (Mulroy Bay surveyed after reaching Donegal Airport due to later low water).	WW 2-3. Hot start, clouding over later. Light drizzle when finished.	Drizzle late and insufficient to stop survey.
Tue	16/08/2011	Portnoo to Blacksod Point excluding Inishkea islands and the Duvillaun islands	~W 3-4 Mainly sunny with scattered clouds; short showers over 1 or 2 of the estuaries.	Brief showers only
Wed	17/08/2011	Blacksod Point to Rinvyle Point including Inishkea islands and Duvillaun islands.	WW 3-4 Hot at start and later, more cloudy over inner coasts. Dry.	
Thu	18/08/2011	Rinvyle Point to Roskeeda Point (Kilkieran Bay) excluding the Mile Rocks and Skerdmore group (Subregion 8.5).	WW 2-4 Hot mostly.	
Fri	19/08/2011	Pilot's mandatory rest day.	Wet!	Surveying would have been impossible due to persistent rain and strong winds.
Sat	20/08/2011	Roskeeda Point (Kilkieran Bay) to Oranmore Bay excluding the Feraun group and Eagle Rock group, then jumped straight to known harbour seal haul-outs as far as Ballyvaghan Bay without covering the entire coast.	WW 2-3, hot but cooler rocks.	Fairly big swell from ~SW washing some exposed rocks. This section to be repeated in 2012.

Table 2. A comparison of the numbers of harbour seals counted in regions (i.e. counties) and subregions of the north and north-west of Ireland in August 2003 and in August 2011. The right-hand column shows the percentage difference between the two surveys.

REGION	SUBREGION	SUBREGION CODE	HARBOUR SEALS COUNTED		DIFF.
			2003	2011	IN %
DONEGAL	LOUGH FOYLE WEST	04_01	4	0	
DONEGAL	INISHOWEN HEAD TO MALIN HEAD	04_02	0	0	
DONEGAL	GARVAN ISLES & INISHTRAHULL	04_03	0	0	
DONEGAL	MALIN HEAD TO FANAD HEAD	04_04	5	20	
DONEGAL	MULROY BAY	04_05	57	59	
DONEGAL	SHEEP HAVEN	04_06	0	17	
DONEGAL	INISHBOFIN, DONEGAL	04_07	12	16	
DONEGAL	TORY ISLAND	04_08	0	0	
DONEGAL	INISHFREE BAY	04_09	268	230	
DONEGAL	ARANMORE ISLAND, DONEGAL	04_10	0	0	
DONEGAL	GWEEBARRA BAY	04_11	42	103	
DONEGAL	DAWROS HEAD TO ROSSAN POINT	04_12	17	5	
DONEGAL	KILLYBEGS	04_13	0	14	
DONEGAL	DONEGAL BAY	04_14	150	190	
DONEGAL	Total	04	555	654	+17.8%
LEITRIM	Total	05	0	0	-
SLIGO	DERNISH	06_01	12	4	
SLIGO	INISHMURRAY	06_02	0	0	
SLIGO	SLIGO BAY	06_03	257	224	
SLIGO	SLIGO WEST	06_04	107	81	
SLIGO	Total	06	376	309	-17.8%
MAYO	KILLALA BAY WEST	07_01	1	0	
MAYO	NORTH MAYO	07_02	0	0	
MAYO	STAGS OF BROADHAVEN	07_03	0	0	
MAYO	BROAD HAVEN	07_04	47	34	
MAYO	BLACKSOD POINT	07_05	0	0	
MAYO	INISHGLORA	07_06	0	0	
MAYO	INISHKEA NORTH & SOUTH	07_07	0	0	
MAYO	BLACK ROCK, SW of INISHKEA IS.	07_08	0	0	
MAYO	DUVILLAUN MORE	07_09	0	0	
MAYO	BLACKSOD BAY	07_10	69	59	
MAYO	ACHILL ISLAND	07_11	80	90	
MAYO	CLARE ISLAND	07_12	0	0	
MAYO	CLEW BAY	07_13	95	241	
MAYO	KILLARY HARBOUR NORTH	07_14	24	39	
MAYO	INISHTURK	07_15	0	7	
MAYO	Total	07	316	470	+48.7%
GALWAY	INISHBOFIN, GALWAY	08_01	0	1	
GALWAY	KILLARY HARBOUR SOUTH	08_02	0	0	
GALWAY	CLIFDEN BAY	08_03	36	85	
GALWAY	BERTRAGHBOY BAY	08_04	36	94	
GALWAY	SKERDMORE SKERRIES (surveyed in 2012)	08_05	(0)*	-	
GALWAY	KILKIERAN BAY	08_06	146	377	
GALWAY	GALWAY BAY NORTH	08_07	49	55	
GALWAY	INNER GALWAY BAY (partly covered in 2011)	08_08	200	248	
GALWAY	ARAN ISLANDS (surveyed in 2012)	08_09	(39)*	-	
GALWAY	Total (for areas surveyed in 2011)	08	467	860	+84.2%
CLARE	BLACK HEAD (partly covered)	09_01	117*	167*	
N & NW IRELAND	TOTAL HARBOUR SEALS COUNTED IN AREAS SURVEYED IN 2011		1,714	2,293	+33.8%

* not included in totals

Table 3. A comparison of the numbers of grey seals counted in regions (i.e. counties) and subregions of the north and northwest of Ireland in August 2003 and in August 2011. The right-hand column shows the percentage difference between the two surveys.

REGION	SUBREGION	SUBREGION CODE	GREY SEALS COUNTED		DIFF. IN %
			2003	2011	
DONEGAL	LOUGH FOYLE WEST	04_01	0	4	
DONEGAL	INISHOWEN HEAD TO MALIN HEAD	04_02	4	4	
DONEGAL	GARVAN ISLES & INISHTRAHULL	04_03	60	266	
DONEGAL	MALIN HEAD TO FANAD HEAD	04_04	0	3	
DONEGAL	MULROY BAY	04_05	7	3	
DONEGAL	SHEEP HAVEN	04_06	0	5	
DONEGAL	INISHBOFIN, DONEGAL	04_07	23	39	
DONEGAL	TORY ISLAND	04_08	4	2	
DONEGAL	INISHFREE BAY	04_09	0	43	
DONEGAL	ARANMORE ISLAND, DONEGAL	04_10	0	0	
DONEGAL	GWEEBARRA BAY	04_11	0	48	
DONEGAL	DAWROS HEAD TO ROSSAN POINT	04_12	90	131	
DONEGAL	KILLYBEGS	04_13	26	86	
DONEGAL	DONEGAL BAY	04_14	1	1	
DONEGAL	Total	04	215	635	+195.3%
LEITRIM	Total	05	0	0	-
SLIGO	DERNISH	06_01	0	4	
SLIGO	INISHMURRAY	06_02	109	112	
SLIGO	SLIGO BAY	06_03	20	78	
SLIGO	SLIGO WEST	06_04	0	17	
SLIGO	Total	06	129	211	+63.6%
MAYO	KILLALA BAY WEST	07_01	5	0	
MAYO	NORTH MAYO	07_02	0	1	
MAYO	STAGS OF BROADHAVEN	07_03	0	0	
MAYO	BROAD HAVEN	07_04	22	342	
MAYO	BLACKSOD POINT	07_05	2	9	
MAYO	INISHGLORA	07_06	58	36	
MAYO	INISHKEA NORTH & SOUTH	07_07	71	193	
MAYO	BLACK ROCK, SW of INISHKEA IS.	07_08	0	0	
MAYO	DUVILLAUN MORE	07_09	4	33	
MAYO	BLACKSOD BAY	07_10	0	33	
MAYO	ACHILL ISLAND	07_11	63	50	
MAYO	CLARE ISLAND	07_12	1	2	
MAYO	CLEW BAY	07_13	1	7	
MAYO	KILLARY HARBOUR NORTH	07_14	19	12	
MAYO	INISHTURK	07_15	29	8	
MAYO	Total	07	275	726	+164.0%
GALWAY	INISHBOFIN, GALWAY	08_01	10	72	
GALWAY	KILLARY HARBOUR SOUTH	08_02	0	0	
GALWAY	CLIFDEN BAY	08_03	23	64	
GALWAY	BERTRAGHBOY BAY	08_04	29	114	
GALWAY	SKERDMORE SKERRIES (surveyed in 2012)	08_05	(10)*	-	
GALWAY	KILKIERAN BAY	08_06	0	13	
GALWAY	GALWAY BAY NORTH	08_07	0	0	
GALWAY	INNER GALWAY BAY (partly covered in 2011)	08_08	0	11	
GALWAY	ARAN ISLANDS (surveyed in 2012)	08_09	(11)*	-	
GALWAY	Total (for areas surveyed in 2011)	08	62	274	+341.9%
CLARE	BLACK HEAD (partly covered)	09_01	7*	9*	
N & NW IRELAND	TOTAL GREY SEALS COUNTED IN AREAS SURVEYED IN 2011		681	1,846	+171.1%

* not included in totals