

Interim Report No. 5 on Year 5 of Seabird & Marine Mammal Surveys of the Arklow Bank, July 2004 to June 2005



Adult Little Gull

For: Airtricity – June 2005

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2 Introduction

Airtricity and GE Wind Energy are building a 520 MW windfarm on the Arklow Bank off Co. Wicklow. The Arklow Bank is a shallow undersea bank lying between 8km and 13km off Co. Wicklow. It runs in nearly a straight line approximately NNE to SSW for some 26km roughly parallel to the coastline. At the 20m depth contour, the bank is typically about 1.6km wide (1.7km at the widest). Water depth along the centre of the bank varies between 0 and 10m. The bank slopes sharply to the east and west to surrounding depths of 30 to 40m. The slopes at the northern and southern ends are about 1.5km and 2.5km long respectively. In effect, the bank is a clearly defined long narrow steep sided undersea ridge.

The first seven 3.6 MW turbines were installed mainly between August and October 2003. Following testing and commissioning work over the following months, they became operational in late summer 2004. An Environmental Impact Statement (EIS) on the project was published in June 2001. The EIS incorporates a full report on seabirds and marine mammals observed between July 2000 and June 2001 (Year 1, Coveney & Phalan, 2001). The EIS proposed an ongoing monitoring programme of seabirds and marine mammals before, during and for five years after construction of the windfarm. Coveney Wildlife Consulting Ltd (CWC) was commissioned to carry out the monitoring programme from July 2001 onwards. The foreshore lease for the windfarm was granted by the Dept. of the Marine and Natural Resources in January 2002 (Cox 2002). It incorporates the main elements of the monitoring programme, which are:

- 1 Monthly surveys of seabirds and marine mammals on the Bank, the surrounding 5 km (the box), and the cable route area using standard JNCC survey methodology
- 2 Supplementary monthly surveys of the Bank for seabirds, cetacea and plankton.
- 3 Monitoring of the seabird colony on Wicklow Head during the breeding season.
- 4 Feasibility testing of acoustic surveying of porpoises.

The monitoring programme for Years 1 to 3 ran from July 2000 to June 2003, and a report on the three years of pre-construction baseline data was completed in November 2003 (CWC 2003c).

The Year 4 monitoring programme ran from July 2003 to June 2004 and the final report was completed in December 2004 (CWC 2004). In addition to the elements of the monitoring programme mentioned above, two additional monthly seabird and marine mammal surveys of the bank were done during Year 4. This brought to four the total number of visits per month to the bank area. These additional surveys were done due to assess the effects of the first seven turbines. The main aim of the Year 4 programme was to ensure that any reduction in bird usage of the turbine area of the bank will be measured and compared with trends on the rest of the bank. Reduction in the bird usage of the turbine area would be strongly indicative of an adverse effect caused by the turbines – provided that such effects were maintained over more than one year.

Interim reports based on raw data have been used to monitor trends in bird numbers between years. The Year 5 monitoring programme began in July 2004 and this interim report provides preliminary results from the Year 5 monitoring programme (July 2004 to June 2005). The Year 4 (July 2003 to June 2004) raw data and averages of the raw data for the first three years (July 2000 to June 2003) of monitoring are also shown.

3 Methods & Survey Routes

3.1 Methods

The method used on the seabird and marine mammal surveys is as described in the Year 4 report (CWC 2004). From Year 2 onwards birds have been mapped to individual kilometres (CWC 2003c). The boat used on main surveys in Years 1 and 2, and from July to March in Year 3, was the MV Kilquade. This boat then became unavailable and so the remaining main surveys for Year 3 (April, May and June 2003) and all surveys for Year 4 were done on the Firehawk (Figure 1), which was the boat initially used for supplementary surveys and plankton sampling (Figure 2). The Firehawk continues to be used for Year 5 surveys. As the deck observation areas of the Firehawk are well under 5m, the minimum required height for standard JNCC surveys, an observation platform was fitted from May 2003 onwards. The Firehawk has a shallower draft of 1m compared with the Kilquade's 3m draft. This allowed survey routes to be pushed closer to the centre of the bank. This often brought the boat in amongst the flocks of birds using bank. Therefore, surveys of the bank are now done from both sides of the boat.

Figure 1. The Firehawk with observation platform



Plankton samples are collected on one trip per month as described the Year 4 report (CWC 2004).

Figure 2. Collecting plankton samples on supplementary surveys



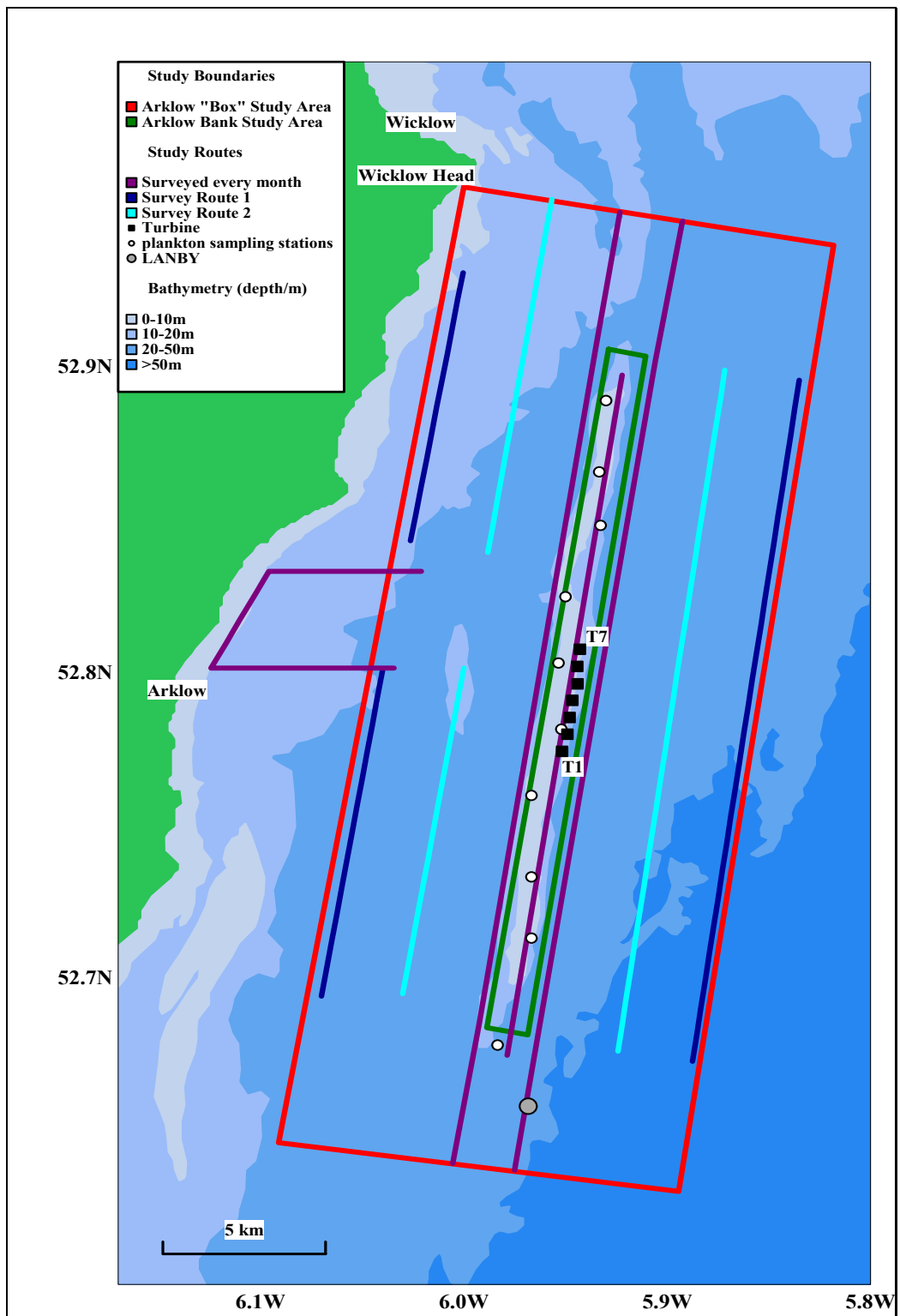
3.2 Survey Routes

The boundaries of the whole study area (the 'Box') and the windfarm area (the 'Bank') are shown in Figure 3 overleaf. Also shown are survey routes ('legs'), the location of the Large Automatic Navigational Buoy (LANBY) and the plankton sampling stations. Finally, locations of the seven turbines that were constructed in autumn 2003 on bank due east of Arklow are also shown.

The survey legs have been modified slightly a number of times. In Year 2, a second parallel route some 3km north of the previous cable route (leg 5) was added to the survey route, to get a better sample within the whole area likely to be used for cables. Survey legs 1A, 4AN, 4AS, 4N and 4S were renamed legs 11, 41, 42, 43 and 44 respectively in Year 3 (Figure 3). Legs 41 and 43 were extended northwards by five and two kilometres respectively to get better coverage of the waters near Wicklow Head.

During Year 4, surveying of the bank area was done along one leg running up the centre of the bank, up to four times per month. This replaced surveying of two bank legs (Legs 2 and 3) in Years 1-3. Coverage was maintained by the use of two observers on some months – one on either side of the boat. In Year 5 survey frequency is reduced to an average of two per month. Coverage of the bank area is maintained by always using two observers in that area.

Figure 3. Map of Arklow Study Area.



3.3 Database

Analysis of the Year 1-3 data is shown in the Year 1-3 report (CWC 2003c) and the Year 4 analysis was completed (CWC 2004). All Year 5 data to date has been entered onto a database based on the JNCC Seabirds at Sea type database. A review of the data since 2000, especially data relating to high counts of key species over the bank has been completed.

3.4 Weather

Despite some bad spells sufficient days were found in July and August to achieve full coverage on the box and to complete two surveys of the bank and to do the fishing survey. However due to frequent unsuitable weather during September we only managed to achieve one full trip and one extra fishing trip. This was mainly due to frequent weather that was just windy enough to exceed the Firehawk's force 4 limit. Furthermore, on the calm day we did get out in September, there was so little wind that fog delayed surveying for about 4 hours. Three trips were done in both October and November. In December two trips were completed while in January poor weather forced an abandonment of one trip while two other trips mainly concentrated on surveying the bank. Full coverage was achieved for the months of February and March, April, May and June.

4 Results

4.1 Overview of Trends in Seabirds Numbers

4.1.1 Background on presentation of the results

The data collected on surveys are shown in the paired charts below. Each pair of charts relates to a particular species' abundances recorded on the Arklow Bank itself and in the surrounding box area. Average data for Years 1 to 3, i.e. the pre-construction period, are shown by **dark yellow** lines. Data relating to Year 4 are presented by **blue** lines. This year's data are presented with **pink** lines. As more than one survey per month has been done on the bank in Years 4 and 5, the monthly bank figures shown these years are the peak numbers recorded in each month. Bank figures for Years 1 to 3 are numbers recorded on main surveys.

Note that the data shown are raw numbers. Raw numbers are also shown in milli Bird Units (mBUs) on the right hand axis of the charts (1 BU = 1% of the species bio-geographical population). While mBUs can be compared between "raw numbers charts", neither numbers or mBUs on these charts can be directly compared with those on the annual report charts. This is because the raw numbers will change when they are extrapolated to the full bank or box areas during formal data analysis. Raw numbers only give a general indication of species trends in the whole of the Arklow Bank study area. In particular, the very high numbers recorded recently in the autumn and early winter of 2004 will need to be analysed in more detail.

4.1.2 Recent unprecedented numbers of small gull species

By far the most notable change this year has been the very high numbers of four species of small gulls that have been recorded since October 2004. Two of these species, kittiwake and little gull have been recorded in high numbers in previous years but the totals this year are far higher. The third species, common gull, started to put in an appearance last winter but the numbers this winter are far higher. The fourth species, black-headed gull, was previously recorded in very low numbers. Other species such as shag, gannet, common tern, guillemot and razorbill have also been recorded in higher numbers in recent months, although the changes have not been as dramatic as for the small gull species. The large numbers of small gull species have been most notable in the area of the bank to the south of the turbines. This is presumably due to the occurrence of large amounts of prey in this area.

4.1.3 Highlights in Years 1-4

Seven species, fulmar, Manx shearwater, gannet, shag, common tern, guillemot and razorbill occur regularly on the bank in the July to September period. Numbers of these species for the first two months of Year 5, i.e. July and August 2004, were generally similar to numbers for these months in previous years. However in September 2004, the bank numbers of all of these species except fulmars were well above those for the same months in the 2000 to 2003 period.

Little gulls, red-throated divers and kittiwakes show winter peaks in all years, although kittiwake numbers were also high in April and May of Year 4. As usual, the counts for these species in July to September 2004 were low. Large numbers of guillemots were recorded in the box in July of Year 1. Numbers of guillemots in the box were low in July Year 4 but this year (Year 5) numbers are in keeping with averages recorded over Years 1-3. Good numbers of razorbills were also recorded in July in Years 1-3, particularly in Year 1, but numbers are lower in Years 4 and 5.

Common terns are absent from the study area over the winter months and peaks in their numbers occurred in July and August in Years 1 and 2. In Year 4 peaks were seen over the box in September and over the bank in May. The highest numbers to date occurred this September. Arctic terns (no chart shown) have been recorded in the study area almost exclusively in May, with the exception of a small number of records in August and September of Year 2. The terns using the banks may be using it as a short term staging area on migration. However, the numbers are low in population terms and in comparison the several thousands of these species that roost in Dublin Bay in August and September.

Two roseate terns were recorded in the box in September of Year 4. Another 8 were seen in May of Year 4 - 6 were at the LANBY and 2 on the North Arklow Buoy. None have been seen in Year 5. A total of 6 were recorded in Year 3, all sighted at the LANBY in August. In Year 2 a total of 40 birds were recorded in August and September, 28 of which were on or near the South Arklow Buoy. Just one roseate tern was recorded in Year 1. The birds recorded appear to use the Arklow Buoys and the Arklow Lanby as roosting sites. Although small numbers of roseate terns can be significant in bird unit terms, these numbers are still relatively low given the c. 600 pairs breeding on Rockabill and the high numbers seen on the Kish Light in 1999 (Newton & Crowe 1999).

The interim reports to date suggest that there has not been any large reductions in the use of the bank since the first seven turbines were installed. In fact, several species appear to have increased their usage of the bank as a whole since the turbines were constructed. However, it must be stressed that these interim reports are not designed to show localised changes in the vicinity of the turbines. Furthermore, the occurrence high numbers of several bird species and northern krill in September 2004 strengthens the hypothetical link between the high numbers of birds and the occurrence of this planktonic species.

4.1.4 Observations of passerines

Numbers of passerines observed during surveys of the Arklow and Codling Banks (CWC 2002 & 2004) have been generally negligible. Prior to September 2004, the only exception has been visible migration of hundreds of starlings (*Sturnus vulgaris*) westwards across the Irish in November on both banks. As the Firehawk left Arklow on 5 September 2004 at about 09.30 am, fog closed in and visibility was poor until 1.30 am. During this period the Firehawk travelled to the North Arklow light and waited there until the fog lifted.

During this time an estimated 500 swallows (*Hirundo rustica*) and small numbers of other passerine species were seen. A single sparrowhawk (*Accipiter nisus*) also followed the boat for some time (Figure 4). Given the conditions of poor visibility, it was not possible to say if there were additional birds flying in the rotor zone. However, it must be stressed that all of the passerine species observed to date are very common. Furthermore, such foggy conditions normally occur in calm conditions when the turbine rotors would be either stationary or idling. Therefore, it is considered that the risk of collisions is low.

Swallows, although not in the same numbers as September, were recorded off the coast heading for Wicklow for the breeding season.

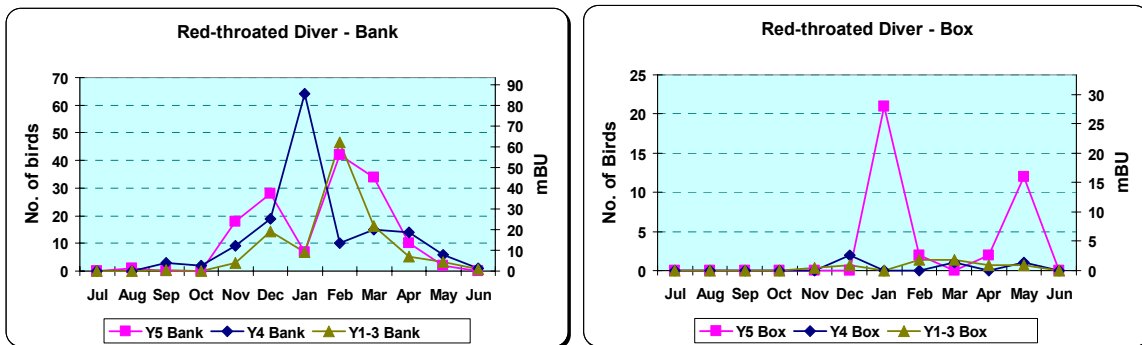
Figure 4 Sparrowhawk in the fog about 5km west of the bank on 5 Sep 2004



4.2 Birds Species Accounts

4.2.1 Red-throated diver (*Gavia stellata*)

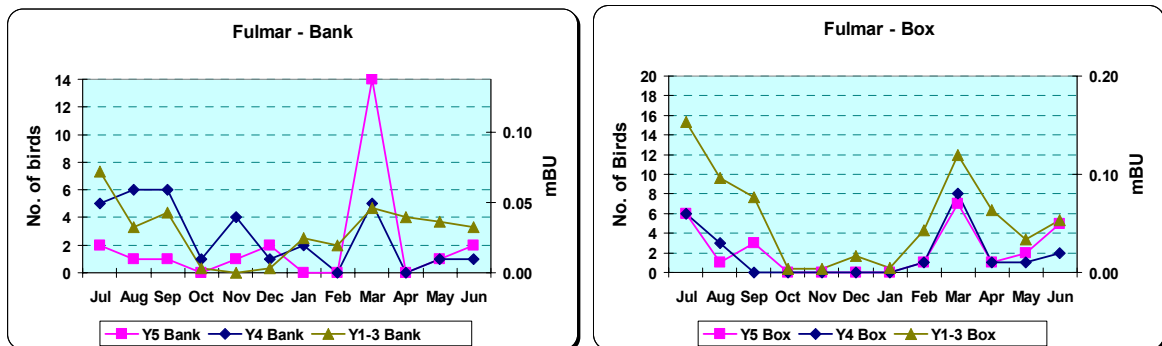
Figure 5. Raw Numbers of red-throated divers recorded in the Arklow Study Area



The pattern of occurrence of red-throated divers is similar between years: Numbers peak over the bank during the winter. Numbers peaked in January of Year 4 and on average in February over Years 1-3. A similar pattern emerged this year on the bank but in the box area a pronounced peak is evident. This peak relates to an area of the box just north of the bank. A secondary peak was noted on the box in May.

4.2.2 Fulmar (*Fulmarus glacialis*)

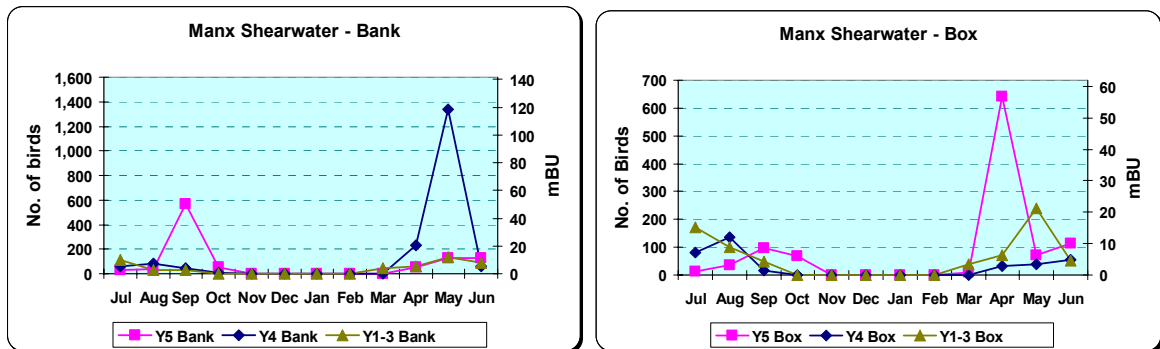
Figure 6. Raw Numbers of fulmars recorded in the Arklow Study Area



Peaks in fulmar numbers occur in the early spring and late summer/early autumn, although larger numbers were seen over the bank in November Year 4 as compared to previous years. An unusually high number of fulmars were recorded on the bank in March. This spike is echoed from the box data, which is similar to the Year 4 peak that also occurred during March.

4.2.3 Manx shearwater (*Puffinus puffinus*)

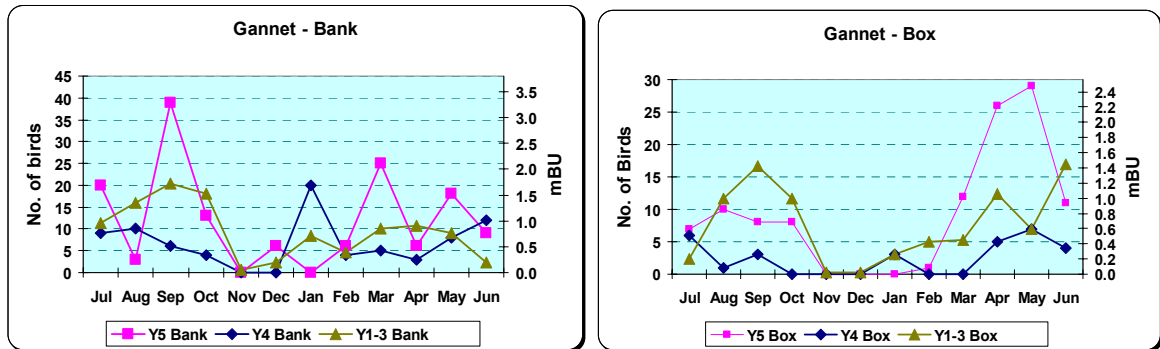
Figure 7. Raw Numbers of Manx shearwaters in the Arklow Study Area



Manx shearwaters are absent over the winter months and return to the study area in March/April. Numbers have peaked in May in all years. There was an exceptionally large peak of 1,341 birds over the bank in May of Year 4. A smaller peak of about 550 was recorded this September. Manx shearwaters were present on the bank this spring/early summer in modest numbers but the most notable incident was the 600+ birds that were recorded over the box in April.

4.2.4 Gannet (*Sula bassana*)

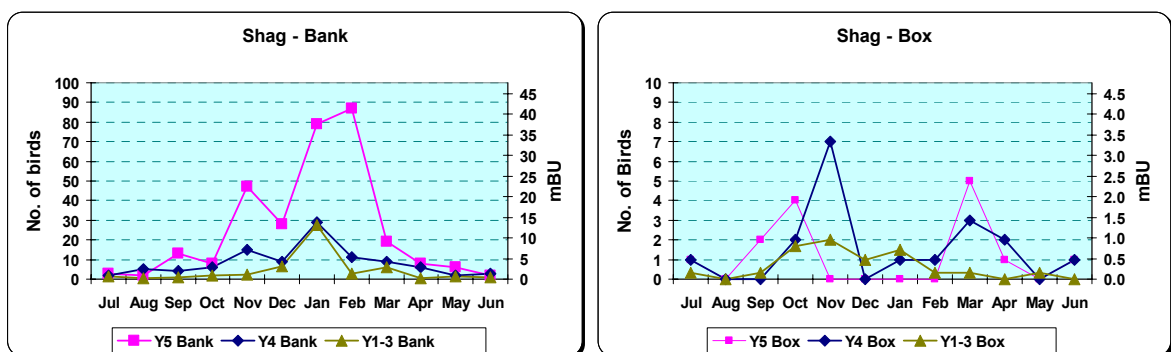
Figure 8. Raw Numbers of gannets recorded in the Arklow Study Area



Looking at both the bank and box data it is evident that gannet activity is usually at its lowest during the winter months. Higher than average numbers were noted on the bank during September, March, May and June. A notable peak was recorded over the box during April and May this year.

4.2.5 Shag (*Phalacrocorax aristotelis*)

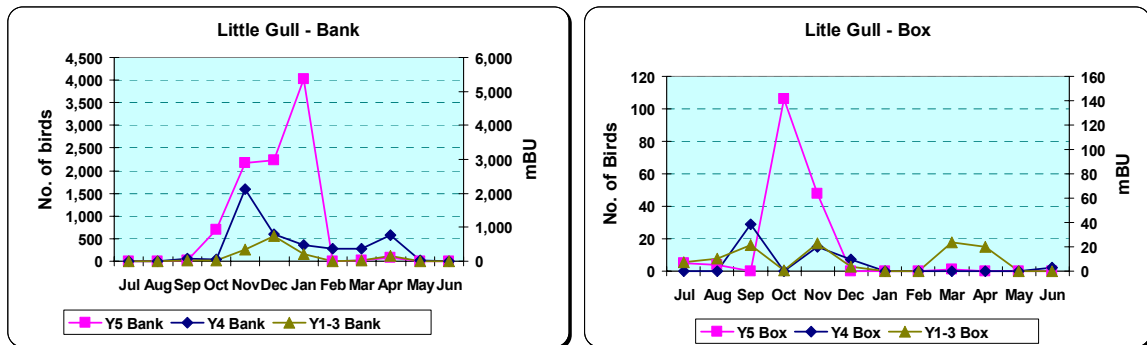
Figure 9. Raw Numbers of shags recorded in the Arklow Study Area



The winter months of Year 5 was an unprecedented season for the presence of shags on the bank. Numbers have decreased, as with other years, as time progressed. The numbers of shags recorded over the bank during year 5 has been characterised by two peaks occurring each side of the winter months.

4.2.6 Little gull (*Larus minutus*)

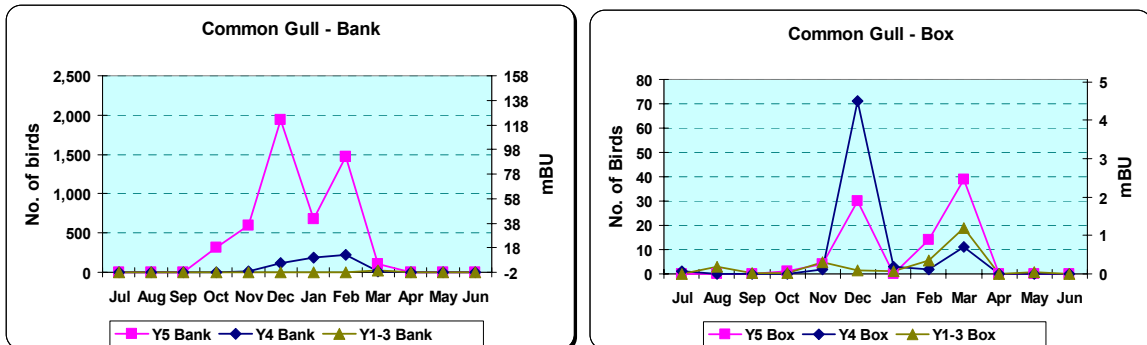
Figure 10. Raw Numbers of little gulls recorded in the Arklow Study Area



Little gull numbers peak over the bank in winter. Numbers for July to September Year 5 are in keeping with numbers for July in previous years. Numbers on the bank started to rise in October this year, which is earlier than normal. Large numbers of little gulls were recorded in November and December 2004 (approximately 2,160 each). The first count in January recorded unprecedented numbers on the bank of over 4,000 individuals. These were mainly in the area south of the turbines, with smaller numbers in and to the north of the turbine zone. Little gulls started to leave both box and bank during the latter months of the winter with only occasional sightings been recorded since then.

Common gull (*Larus canus*)

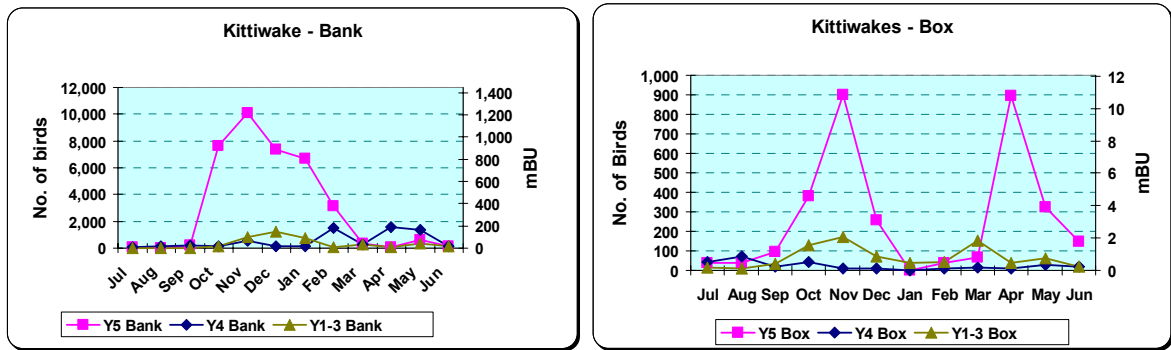
Figure 11. Raw Numbers of common gulls recorded in the Arklow Study Area



Larger numbers of common gulls were recorded over the bank between November and February in Year 4 as compared to previous years. However, this rise has been dwarfed by the much larger increase in numbers this winter, which peaked at about 1,940 birds in December. As with little gulls, these were mainly in the area south of the turbines, with smaller numbers in and to the north of the turbine zone. Common gulls experienced a drop in abundance during January on both the bank and box but February saw a resurgence in numbers on the bank and box. In fact numbers continued to rise in the box area to almost 40 individuals – the highest in this area yet.

4.2.7 Kittiwake (*Rissa tridactyla*)

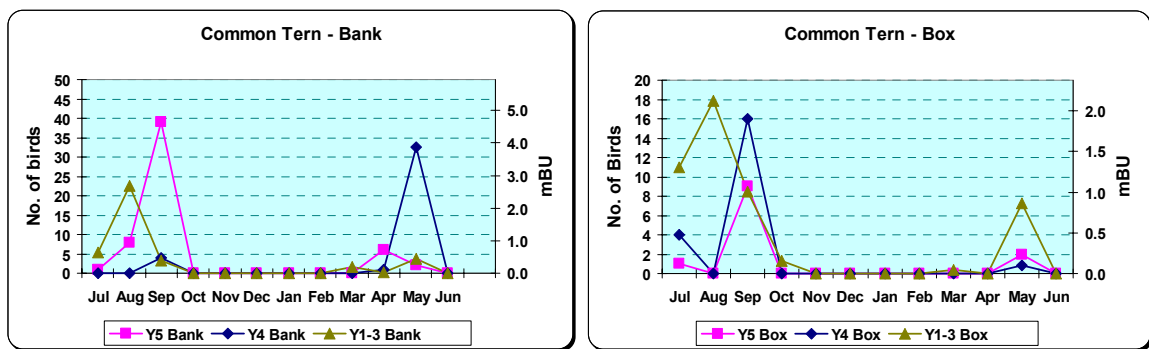
Figure 12. Raw Numbers of kittiwakes recorded in the Arklow Study Area



Kittiwake numbers peak over the bank in winter. In Year 4, the high numbers occurred in February, April and May. Smaller peaks did occur in March and May in Years 1 to 3. However, these peaks have been dwarfed by the much larger increase in numbers this winter, which peaked at about 10,000 birds in November. As with the other small gull species, these were mainly in the area south of the turbines, with smaller numbers in and to the north of the turbine zone. Average numbers of Kittiwakes on the Box during Years 1 – 3 showed a bimodal pattern. In Year 5 this pattern was much exaggerated with two peaks of approximately 900 individuals being recorded on both occasions.

4.2.8 Common tern (*Sterna hirundo*)

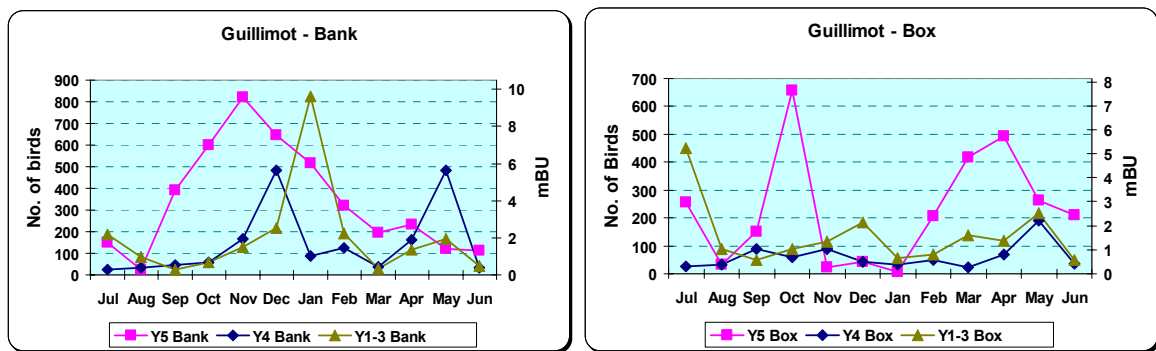
Figure 13. Raw Numbers of common terns recorded in the Arklow Study Area



In Years 1 to 3 numbers peaked between July and September. In Year 4 a larger peak of just over 30 birds was recorded over the bank in May. Thirty-nine birds, the highest record to date on the bank, were recorded in September of Year 5. This year's spring migration of Common Terns was not picked up to any great extent on either the box or the bank.

4.2.9 Guillemot (*Uria aalge*)

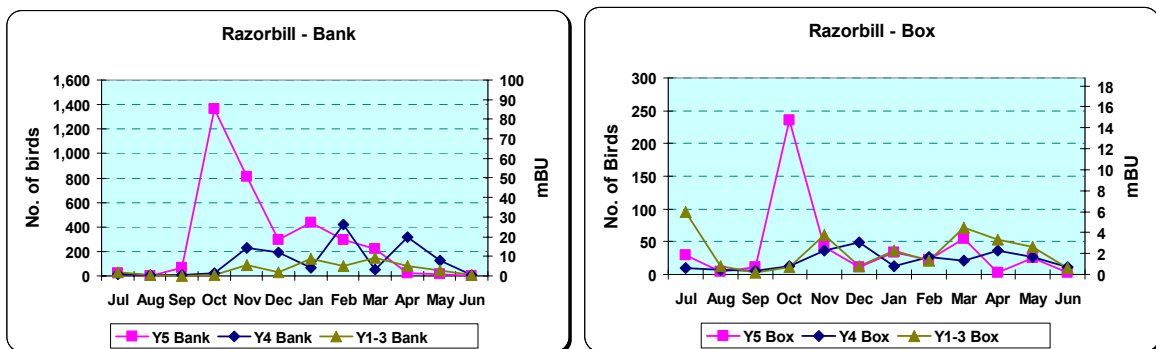
Figure 14. Raw Numbers of guillemots recorded in the Arklow Study Area



Guillemot numbers peaked this year with nearly 700 birds in the box and over 800 birds being recorded on the bank in October and November respectively. Guillemots had winter peaks in numbers on the bank Years 1-4. There was also a high peak over the bank in May Year 4. There seems to be very little correlation between the patterns of abundance on the box and the bank. As a secondary peak on the box during April, May and June this year occurred while numbers on the bank were in decline.

4.2.10 Razorbill (*Alca torda*)

Figure 15. Raw Numbers of Razorbills Recorded in the Arklow Study Area



Numbers of razorbills on the bank were considerably higher than previously with peaks nearly 1,400 birds in October and about 800 in November. A large peak of nearly 250 individuals was

also recorded in October in the box area. As with other years, the numbers of Razorbills decline as the summer progresses.

4.2.11 Black-headed Gull (*Larus ridibundus*)

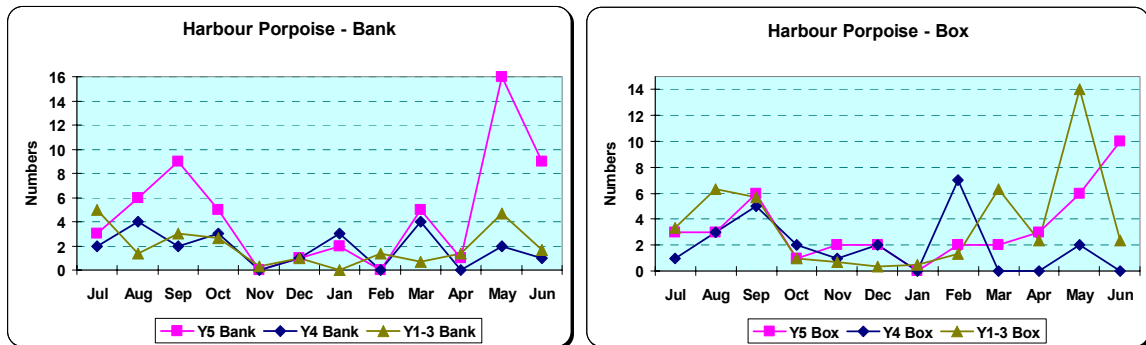
Prior to this year, very low numbers of this species were recorded in the study area. However, about 840 were recorded on the bank in November and about 1200 were recorded in December. The pattern of occurrence on the bank was similar to the other small gull species with large flocks to the south of the turbines and smaller numbers in and to the north of the turbine zone. Black-headed gulls have not been recorded since March (no chart shown).

4.3 Marine Mammals.

Harbour porpoise is the most common marine mammal by far. Smaller numbers of grey seals, common seals and Risso's dolphins have been recorded in the study area so far.

4.3.1 Harbour porpoise (*Phocoena phocoena*)

Figure 16. Raw Numbers of Harbour Porpoises Recorded in the Arklow Study Area



Harbour porpoises were recorded in higher than normal numbers on the bank during the autumn and summer. Box numbers of these marine mammals this year seem to be in keeping with previous years.

4.3.2 Risso's dolphin (*Grampus griseus*)

There was a single sighting of a possible Risso's dolphin in August of Year 4 although this animal was not recorded while on survey. In Year 3 sightings were recorded in July (three) and September (one probable). Although none were recorded on survey, the Irish Whale & Dolphin Group (IWDG) reported up to 50 Risso's dolphins off the South Dublin/Wicklow coast between Greystones and Newcastle in the last week of May Year 3. Interestingly, a pod of 7 Risso's dolphins off Wicklow Head were again reported by the IWDG in May of Year 4. No Risso's dolphins were recorded on survey in Year 2, and 10 were seen in July of Year 1. In Year 5, Risso's dolphins have been recorded during the months of May and June.

4.3.3 Grey seal (*Halichoerus grypus*)

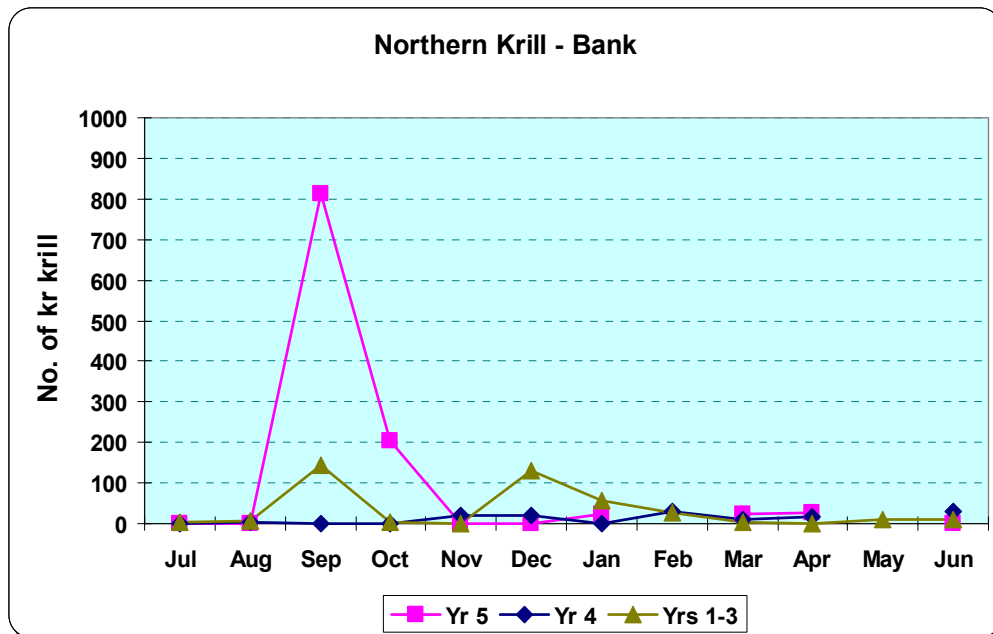
Two grey seals were recorded in Year 4, in August and June. And once again two grey seals has been recorded in Year 5.

4.4 Plankton Sampling

Plankton sampling on the bank is continuing in Year 5. Data collected over Years 2 and 3 were presented in an interim report in May 2003 (CWC 2003a). Plankton sampling only took place on two trips in Year 1 and the May year 4 trip was not done due to bad weather.

The birds feeding over the bank may be using some of the species caught, especially the northern krill (*Meganyctiphanes norvegicus*) and/or other invertebrates. Large peaks in krill numbers occurred in September and December in Year 3 and in Year 2 there was a peak in January, but Year 4 numbers were lower. However, by far the largest peak in numbers occurred in this September, mainly at the south end of the bank. The September fishing samples were taken during a short period of calm weather on 29 September and large numbers of kittiwakes, possibly as many as 5,000, were noted in passing on the southern part of the bank. In addition, about 60 little gulls and 50 terns were also recorded in this area. It was intended to do a bird survey on the following day on 30 September but as with several other days in that month, the forecast deteriorated during the day before and it the survey had to be called off that morning. This was unfortunate as it may be the clearest indication to date of the correlation between the occurrence of northern krill and feeding flocks of birds on the bank. Numbers of krill dropped markedly in October but were still high compared to previous years. Despite the very high numbers of birds present into December, the numbers of krill in November and December were very low; a slight increase was recorded in January. Due to high seas the plankton net broke from its tether during the February trip. A replacement net was acquired for the March and subsequent fishing trips.

Figure 17. Raw Numbers of northern krill on the bank



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