



# **Monitoring cetaceans in Irish waters**

**ISCOPE II (2006-2009)**

**Annual Report (2006-2007)**

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## ISCOPE II (2006-2008)

### Introduction

Irish waters provide some of the most important habitats for cetaceans (whales, dolphins and porpoises) in Europe. To date, 24 species have been recorded including some of the most rare and poorly understood whales in the world (Berrow, 2001). Two cetacean species, (harbour porpoise *Phocoena phocoena* and bottlenose dolphin *Tursiops truncatus*), are listed under Annex II of the EU Habitats Directive and are priority species for Natura 2000. This commits member states to nominate critical sites to protect their habitats. All cetacean species (baleen whales, dolphins, harbour porpoise and toothed whales) are listed as priority species for conservation in Northern Ireland. Conservation measures, including site designation, are constrained by lack of reliable data on the distribution and relative abundance of these and other cetacean species in Irish waters.

Monitoring these highly mobile and largely inaccessible animals and identifying critical habitats is difficult and many countries have developed stranding and sighting schemes for this purpose. Data obtained through a cetacean stranding schemes have recently been recognized as a Marine Environmental Impact Indicator and “an important tool for describing trends in cetacean numbers and distribution” (Boelens *et al.* 2004).

As a network of marine protected areas (MPAs) is created around the coast of Ireland, the issue of monitoring Annex II species outside of MPAs has been raised. All Annex II marine mammal species will spend considerable time outside of MPAs designated for their protection and most of the populations involved will reside exclusively outside of MPAs. Thus a system of monitoring these species throughout their range in Irish waters is essential not only to monitor species but also identify sites, which might qualify for MPA status. Distribution and abundance data are also important for addressing management issues such as the impact of fisheries bycatch to supporting marine tourism.

The IWDG stranding and sighting schemes, established in 1991, provide a baseline for an All-Ireland cetacean recording scheme and enables agencies and government departments to fulfill obligations under many national and international agreements, including Natura 2000, ASCOBANS, OSPAR and the recently published Northern Ireland Biodiversity Strategy and National Biodiversity Plan. These data are essential to contribute to Local Biodiversity Action Plans and Species Action Plans, which are expected to be implemented over the next few years. Cetacean recording is an essential marine component of national biological recording initiatives such as that co-ordinated by the Centre for Environmental Data and Recording (CEDaR) in Northern Ireland and the new Biological Records Centre in the Republic. Under both the Northern Ireland Biodiversity Strategy and National Biodiversity Plan, a conservation assessment of all Annex II and IV (all cetaceans) is required and the data gathered under ISCOPE II is essential in the formulation of this assessment.

In 2003, the IWDG initiated the Irish Scheme for Cetacean Observation and Public Education (ISCOPE), which aimed to promote better awareness and knowledge of cetaceans (whales, dolphins and porpoises) in Irish waters, by encouraging public participation in cetacean recording. ISCOPE has proved very successful and the IWDG

are building on the success of this initiative by continuing to expand the recording network and improve data management.

## **Objectives of ISCOPE II**

The objectives of ISCOPE II are to:

- 1) continue to raise awareness of cetaceans in Irish waters,
- 2) further encourage participation in biological recording,
- 3) organize training workshops to improve cetacean identification and recording skills,
- 4) continue and expand quantified effort watches at selected sites,
- 5) exploit “platforms of opportunity” to increase seasonal and geographic coverage of offshore habitats,
- 6) maintain cetacean sightings and strandings databases
- 7) develop indices for monitoring population status and relative abundance
- 8) collaborate with other projects attempting to integrate marine data-sets

## **Administration**

ISCOPE II was started on 1 May 2006. Deliverance of the objectives of is overseen by a Steering Committee. Each funding body are represented on the Committee (see Appendix I for members). The ISCOPE II budget was managed by George Delaney of the IWDG and draft accounts for the period 1 May 2006 to 30 April 2007 are presented in Appendix II. In order to achieve these objectives the work schedule has been divided into four work packages. Those responsible for each workpackage are identified.

### Work package 1

Task: Encourage and train the public and agencies to record cetaceans in Irish waters.

Responsibilities: Simon Berrow and Pdraig Whooley

### Work package 2

Task: To carry out quantified effort monitoring

Responsibilities: Pdraig Whooley (Sightings), Mick O’Connell (Strandings) and Simon Berrow

### Work package 3

Task: Carry out cetacean surveys on Ships of Opportunity (ShOPs)

Responsibilities: Dave Wall

### Work package 4

Task: Maintain cetacean database and develop monitoring indices

Responsibilities: Simon Berrow, Mick O’Connell (Strandings) and Pdraig Whooley (Sightings)

## Work package 1

### Encourage and train the public and agencies to record cetaceans in Irish waters

Tasks:

- 1.1 promote ISCOPE II, including participation at national and regional exhibitions,
- 1.2 continue to organise and deliver courses on recording and species identification,
- 1.3 encourage greater participation from government agencies who are regularly at sea
- 1.4 develop procedures to ensure feedback to observers
- 1.5 improve and reprint recording forms as required

**Table 1: Large scale events at which ISCOPE II was promoted 1 May 2006 – 30 April 2007**

| Date             | Event                    | Location                    | County    | Who delivered    | Attendance |
|------------------|--------------------------|-----------------------------|-----------|------------------|------------|
| 21-May-06        | Fingal Biodiversity Day  | Fingal                      | Dublin    | DW               | 2000       |
| 27-28 May-06     | Celtic Maritime Festival | Portrush                    | Antrim    | IE, TE           | 10,000+    |
| 27-May-06        | Clare Biodiversity Day   | Ruan                        | Clare     | SB, FB, JA       | 1000       |
| 10-11 June-06    | World Ocean's Festival   | Tramore                     | Waterford | PW, DW           | 1,000      |
| 11 June-06       | World Ocean's Festival   | Marine Institute            | Galway    | SB, FB, JO'B     | 5,000      |
| 29 Jun-1 July-06 | Fish Ireland Exhibition  | Killybegs                   | Donegal   | SB, PW, DW       | 1,500      |
| 1-2 July-06      | Animal Magic             | Wildfowl and Wetlands Trust | Down      | IE, TE, RE       | 2,000+     |
| 14-18 Feb -07    | IMF Boat Show            | RDS                         | Dublin    | PW, MO'C, DW, VM | 5,000+     |

JA= Janelle Atkinson, FB= Frances Bermingham, SB= Simon Berrow, IE= Ian Enlander, TE= Tina Enlander, RE= Rebecca Enlander, JO'B= Joanne O'Brien, MO'C= Mick O'Connell, DW= Dave Wall, PW= Pádraig Whooley, RC= Randall Counihan, VM= Vincent Murphy

Progress during ISCOPE II:

- 1.1 We have promoted ISCOPE II at 20 events in 13 counties including large-scale events (Table 1) and public talks (Table 2). A major commitment this year was attendance at Fish Ireland Exhibition in Killybegs, Co Donegal. We hoped to engage widely with the fishing industry at this 3-day event but attendance was down significantly especially fishers from the south and southwest coasts. However we received a lot of positive feedback and leads. We also tried to book a stand at the inshore fishing exhibition hosted by the Irish Skipper in Galway but no stands were available. We have booked a stand for this event in 2008. A number of large-scale events, especially Animal Magic and the Celtic Maritime Festival, has increased the profile of the IWDG and ISCOPE in Northern Ireland (Table 1).

It is not easy to quantify the impact of these large-scale events but undoubtedly it increases public awareness of cetaceans in Irish waters and the importance of the marine environment. The widely publicised sperm whale stranding in Sligo led to a series of lectures and school visits being organised by the county Environmental Awareness Officer. These are not included in Table 2. ISCOPE was also promoted extensively during WhaleWatch Ireland in August 2006, which attracted around 1500 people at 13 sites.

**Table 2: Public talks at which ISCOPE II was promoted 1 May 2006 – 30 April 2007**

| Date           | Event                       | Location         | County   | Who delivered | Attendance |
|----------------|-----------------------------|------------------|----------|---------------|------------|
| 2-June-06      | Celtic Maritime Festival    | Derry            | Derry    | IE            | 24         |
| 29-July-06     | Galway Biodiversity         | Spiddal          | Galway   | SB, JO'B      | 30         |
| 29-July-06     | Rathlin Island              | Rathlin          | Antrim   | LMcA, IE      | 65         |
| 26-August-06   | Coastal Awareness Day       | Waterville       | Kerry    | MO'C          | 50         |
| 27 August-06   | Lighthouse talk             | Galley Head      | Cork     | PW            | 20         |
| 2 October-06   | Public talk                 | Sligo IT         | Sligo    | PW, MO'C      | 25         |
| 4 October-06   | Public Talk, Harry's Bar    | Rosses Point     | Sligo    | PW            | 15         |
| 24 October-06  | ISOM                        | Marine Institute | Galway   | SB, DW        | 70         |
| 14-November-06 | Science Week                | Sligo IT         | Sligo    | SB            | 80         |
| 23 January-07  | Copeland Bird Observatory   | Belfast          | Antrim   | IE            | 20         |
| 7 April -07    | West Limerick Wildlife Club | Glenstall        | Limerick | SB            | 20         |
| 13 April- 07   | Public talk, Sailing Club   | Greystones       | Wicklow  | PW            | 50         |

SB= Simon Berrow, IE= Ian Enlander, LMcA= Louise McAlvarey, JO'B= Joanne O'Brien, MO'C= Mick O'Connell, DW= Dave Wall, PW= Pádraig Whooley

- 1.2: Courses on species identification: Weekend on Rathlin Island provided training to EHS staff (Table 2). As has been the system in ISCOPE courses are delivered largely on request from local communities. A second identification course is scheduled for Howth in October 2007.

**Table 2. ISCOPE courses on species identification**

| Date            | Event                    | Location       | County | Who delivered | Attendance |
|-----------------|--------------------------|----------------|--------|---------------|------------|
| 29 July-06      | Rathlin Island           | Rathlin        | Antrim | LMcA, IE      | 65         |
| 26-September-06 | Shannon RF Board Seminar | Lough Sheelin  | Cavan  | SB            | 40         |
| 14 October-06   | Cetacean ID course       | Dzogchen Beara | Cork   | PW            | 24         |
| 24 June-07      | Shannon Dolphin Centre   | Kilrush        | Clare  | SB            | 10         |

SB= Simon Berrow, IE= Ian Enlander, LMcA= Louise McAlvarey, MO'C= Mick O'Connell, PW =Pádraig Whooley,

- 1.3: Encourage government agencies: There have been a number of initiatives aimed at Agency staff. A weekend on Rathlin Island provided training to EHS staff. At the Shannon Regional Fisheries Board in Co Cavan, cetacean recording and website access was presented to representatives of both Shannon and the Western Regional Fisheries Board. A refresher course with the Maritime Squadron was carried out in May at Baldonnel, Co Dublin. The IWDG were invited to deliver specific courses aimed at their field staff in the New Year however this has not materialised yet. We have been trying to organise a training course in Mayo for NPWS Staff, one in Antrim for EHS staff as well as a course on the east coast. Recording forms and details on ISCOPE were forwarded to the two regional EPA offices (Dublin and Castlebar) to encourage them to collect cetacean sightings during WFD monitoring trips.

- 1.4: Develop procedures: we have included in the website upgrade a facility for submitting copies of effort forms electronically, similar to Casual Sightings. This was requested by some NPWS staff however it has not proved to be as useful as hard copies as the information submitted is restricted making validation more difficult.
  
- 1.5: Reprint recording forms: We will require a revision and a reprint of the Casual Sighting form soon.

## Work package 2

### To carry out quantified effort monitoring

#### Tasks:

- 2.1 continue to encourage collection of effort related sightings data and strandings data
- 2.2 help those people who regular collect casual sightings data to carry out effort watches
- 2.3 carry out at least one watch per month during the same week from eight sites in the Republic of Ireland identified by the NPWS as key monitoring sites
- 2.4 carry out at least one watch per month at the two harbour porpoise cSACs (Roaringwater Bay and Blasket Islands).
- 2.5 liase with EHS about regular monitoring of two key sites in Northern Ireland coinciding with potential SACs for harbour porpoise

#### Progress during ISCOPE II:

- 2.1 To date 1,270 cetacean sighting and 144 stranding records have been received for the period from 1 May 2006 to 30 April 2007 (Table 3).

**Table 3. Number of biological records received 1 May 2006 to 30 April 2007**

| Data                       | 2006 |     |     |     |     |     |     |     | 2007 |     |     |     | Total       |
|----------------------------|------|-----|-----|-----|-----|-----|-----|-----|------|-----|-----|-----|-------------|
|                            | May  | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Jan  | Feb | Mar | Apr |             |
| Stranding records          | 13   | 10  | 11  | 17  | 9   | 10  | 9   | 13  | 17   | 9   | 18  | 8   | <b>144</b>  |
| Sighting records           | 90   | 167 | 185 | 178 | 113 | 119 | 79  | 45  | 85   | 67  | 44  | 97  | <b>1270</b> |
| Effort watches             | 30   | 41  | 51  | 43  | 43  | 30  | 33  | 16  | 23   | 27  | 21  | 43  | <b>401</b>  |
| Sightings (effort watches) | 20   | 60  | 51  | 55  | 33  | 38  | 34  | 13  | 32   | 26  | 29  | 39  | <b>430</b>  |
| Effort sites watched       | 16   | 24  | 21  | 19  | 25  | 17  | 23  | 12  | 16   | 21  | 14  | 19  |             |

#### *Stranding Records*

The number of stranding records reported to the IWDG in 2006/07 was 144 of 15 species, which was the highest total for a single year since records were kept (Fig. 1). This includes the first record of sei whale since 1914 and two Sowerby's beaked whales. This figure excludes the records of 4 basking sharks and 2 leatherback turtles.

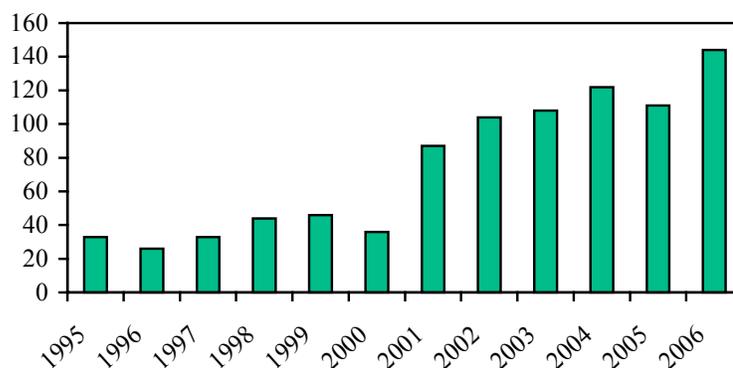


Figure 1. Number of stranding records 1995-2006

The increase in stranding records is attributed to an increase recording effort rather than an increase in the abundance of cetaceans in Irish waters or increased mortality. In the UK, increased strandings, especially of common dolphins and harbour porpoise, have been attributed to increased mortality. The actual number of strandings on the Irish coast is hard to estimate. In some areas we are increasingly getting multiple reporting of the same animal, which suggests good observer coverage. Given the length of the Irish coastline is 1448 km, the stranding rate is 10.05km per stranding. This compares to around 19.4 km per stranding in the UK, given a mean stranding rate of 640 per annum and a coastline estimated at 12,429km in length. It will be interesting to see how this trend in the number of reported strandings develops during ISCOPE II.

*Sighting Records*

Between May 2006 and April 2007 we received 1,270 cetacean sighting records of 10,744 animals, from effort and casual watches combined, comprising eleven species. These figures represent an 11.5% decline in all sightings for the same 12-month period (1 May 2005 -30 April 2006) (Fig 2a).

Of these 1,115 (87.9%) were classified to species level, while the remaining 155 (16%) sightings were downgraded to a non-species specific category. Most sighting records were of harbour porpoise (37.3%), followed by common dolphin (14.2%), bottlenose dolphin (13.1%), minke whale (12%), fin whale sightings (5.6%), Risso’s dolphin (3.5%), humpback whale (1.1%), killer whale (0.6%) and pilot whale (0.3%).

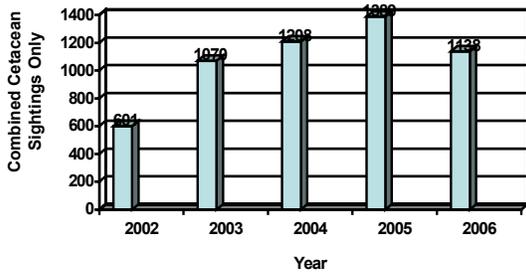


Figure 2a. Number of sighting records 2002-2006

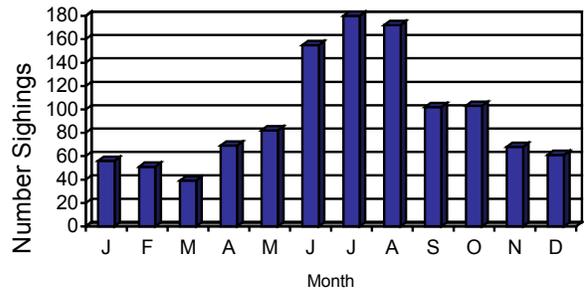


Figure 2b. Monthly distribution of sighting records

Within this period the lowest number of sightings (44) were recorded in March and the highest in July 2007(Fig 2b). This is typical of seasonal distribution and reflects increased recording effort in the summer months and the number of days with favourable sea-state.

This was consistent with the same period 2005-06.

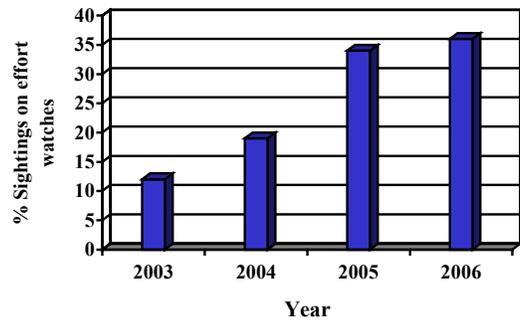


Figure 3. Proportion of sightings from effort watches

## 2.2 Effort watches

During ISCOPE we aim to encourage greater participation in carrying out watches where effort is quantified. There were a total of 401 effort watches, from 47 sites, carried out in 2006/7 resulting in 433 effort sightings. (Table 4). This compares with 474 effort watches from 63 sites in 2005/6 resulting in 386 effort sightings. Although in 2006/7 period the number of effort watches declined by 15.4% compared with 2005 (Fig. 2) there has been a 12.1% increase in the number of sightings on effort.

**Table 4. Sightings comparisons**

|               | <b>Total Sightings</b> | <b>Casual sightings</b> | <b>Efforts Sightings</b> | <b>% Sightings on effort watches</b> | <b>Effort Watches</b> | <b>Sites</b> |
|---------------|------------------------|-------------------------|--------------------------|--------------------------------------|-----------------------|--------------|
| <b>2005/6</b> | 1433                   | 1047                    | 386                      | 27%                                  | 474                   | 63           |
| <b>2006/7</b> | 1270                   | 837                     | 433                      | 34%                                  | 401                   | 47           |
| <b>Diff.</b>  | -11.3%                 | -20.0%                  | +12.1%                   | +7.0%                                | -15.4%                | -25.4%       |

The greatest declines are in Counties Waterford, Cork, Clare, Galway and Mayo. This is largely down to a few individuals. Joanne O'Brien was carrying out a lot of watches in Counties Clare, Galway and Mayo as part of her MSc but is carrying out far fewer as this fieldwork comes to an end. The number of watches from Galley Head, Co Cork has declined due to Pádraig Whooley having other commitments. Andrew Malcolm is now more systematic in his watches from Ardmore, Co Waterford and his watch effort has settled to a more realistic rate. The number of watches from the primary Kerry watch site, Sleah Head is up by 19.3%, as this site is now regularly watched by two observers.

Effort watches in Northern Ireland are very consistent though there are a small number of watches from a large number of sites and effort might be better if it is concentrated into a smaller number of key sites. This shows that we are still reliant on a relatively small number of individuals, but it also shows that if we can attract more people into the effort scheme they can have a significant input into the scheme. More importantly, the proportion of sightings that were obtained during effort watches is now over 34% (Fig. 3), which compares with 27% for the 2005/6 period. This is consistent with our objectives where we are trying to get more people carrying out effort watches. Effort watches peak in the summer (June – August) but there is good coverage in the spring, autumn and winter months (Table 5).

During the reporting period we have 13 sites with more than 10 watches (Table 5).

**Table 5: Location and number of effort watches carried out during 2006-2007**

| Location                            | May       | Jun       | Jul       | Aug       | Sep       | Oct       | Nov       | Dec       | Jan       | Feb       | Mar       | Apr       | Total      |
|-------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------|
| Achill Island, Mayo                 |           |           |           |           |           |           |           |           |           | 1         |           |           | 1          |
| Ballycotton, Cork                   | 1         | 2         |           | 1         |           |           |           |           |           |           |           |           | 4          |
| Black Head, Antrim                  |           |           | 1         | 1         |           |           | 2         |           | 1         | 1         | 1         |           | 7          |
| Blackball Head, Cork                |           | 1         | 2         | 3         | 4         |           | 2         |           | 1         | 1         | 1         | 2         | 17         |
| Blackhead, Clare                    | 1         | 1         |           |           | 1         | 1         | 1         |           | 1         | 2         |           | 2         | 10         |
| Blasket Islands, Kerry              |           |           | 3         |           |           |           |           |           |           |           |           |           | 3          |
| Bloody Bridge/Maggies Leap, Down    | 2         | 2         | 3         | 1         | 1         | 2         | 1         | 2         | 2         | 2         | 2         | 3         | 23         |
| Brandon Point, Kerry                |           |           |           | 1         |           |           |           |           |           |           |           |           | 1          |
| Bray Head, Wicklow                  |           |           |           |           | 1         |           |           |           |           |           |           |           | 1          |
| Cape Clear Isl., Cork               |           |           |           | 2         | 2         |           |           |           |           |           |           |           | 4          |
| Castlepoint, Roaringwater Bay, Cork |           | 1         | 1         | 1         | 1         | 1         | 1         | 1         | 1         | 1         | 1         | 1         | 11         |
| Copeland Islands, Down              |           |           |           |           | 4         |           |           |           |           |           |           |           | 4          |
| Crow Head, Cork                     | 1         |           |           |           |           |           |           |           |           |           |           |           | 1          |
| Donaghadee, Down                    | 1         |           | 1         | 1         |           |           | 1         |           |           |           |           |           | 4          |
| Downpatrick Head, Mayo              |           | 1         | 1         | 1         | 1         | 1         | 1         |           |           |           |           |           | 6          |
| Dun Laoghaire, Dublin               |           |           |           |           | 1         |           |           |           |           |           |           |           | 1          |
| Dunree/Lough Swilly, Donegal        |           | 1         | 1         |           | 1         | 1         | 1         | 1         | 1         | 1         | 1         | 1         | 10         |
| Dursey/Dursey Isl. & Head, Cork     |           |           |           |           |           |           |           |           | 1         |           |           |           | 1          |
| Fanore, Clare                       | 1         | 1         |           |           | 1         | 1         | 1         |           | 1         | 1         | 1         |           | 8          |
| Galley Head, Cork                   | 1         | 1         | 1         | 1         | 1         | 3         | 3         | 2         | 1         |           | 1         | 1         | 16         |
| Grey Point, Down                    | 1         | 1         | 5         | 4         | 3         | 2         | 1         | 1         |           |           |           | 3         | 21         |
| Hags Head, Clare                    |           |           |           | 1         |           |           |           |           |           |           |           |           | 1          |
| Hook Head, Wexford                  |           | 1         | 1         |           | 1         | 1         | 1         |           |           | 1         |           |           | 6          |
| Howth Head, Dublin                  | 2         | 2         | 1         | 1         | 1         |           | 1         |           |           |           | 2         | 2         | 12         |
| Inishown Pen., Donegal              |           |           |           |           |           |           |           |           |           |           |           | 1         | 1          |
| Inishtrahull, Donegal               |           | 3         | 1         |           | 1         |           |           |           |           | 1         |           |           | 6          |
| Loop Head, Clare                    | 1         |           |           | 1         | 2         | 3         | 2         | 1         | 1         | 1         | 1         |           | 13         |
| Magheracross, Antrim                |           |           | 1         |           |           |           |           |           |           |           |           |           | 1          |
| Malinbeg, Donegal                   |           | 2         | 2         |           | 1         | 1         | 1         |           |           |           |           |           | 7          |
| Mullaghmore, Sligo                  |           |           |           |           | 1         |           | 1         |           | 1         | 1         |           | 1         | 5          |
| Newcastle, Down                     | 2         | 2         | 2         |           | 1         | 2         | 1         | 1         | 2         | 1         | 2         | 2         | 18         |
| Old Head Kinsale, Cork              |           |           |           |           |           |           |           | 1         |           | 1         |           |           | 2          |
| Portmuck, Islandmagee, Antrim       | 2         | 1         |           | 1         |           |           | 1         |           |           | 1         | 1         | 1         | 8          |
| Portrush, Antrim                    |           |           | 1         |           |           |           |           |           |           |           |           |           | 1          |
| Ram Head, Waterford                 | 6         | 4         | 4         | 5         | 4         | 3         | 2         | 3         | 4         | 4         | 2         | 4         | 45         |
| Ramore, Antrim                      | 2         | 3         | 4         | 2         | 3         | 3         | 1         | 1         |           | 2         | 3         | 4         | 28         |
| Rathlin Island, Antrim              |           |           | 5         |           |           | 1         |           |           |           |           |           |           | 6          |
| Redcliff, Kerry                     |           |           | 1         |           |           |           |           |           |           |           |           |           | 1          |
| Runkerry Point, Antrim              |           |           |           |           | 2         |           |           |           |           |           |           |           | 2          |
| Sandycove, Dublin                   |           |           |           |           |           |           |           |           |           | 1         |           |           | 1          |
| Slea Head, Kerry                    | 5         | 5         | 8         | 12        | 6         | 3         | 5         | 1         | 3         | 1         | 2         | 11        | 62         |
| Spiddle, Galway                     | 1         | 1         |           |           | 1         | 1         | 1         |           | 1         | 1         |           |           | 7          |
| Tawney, Kilcar, Donegal             |           | 1         | 1         | 3         |           |           |           |           |           |           |           |           | 5          |
| The Gobbins, Antrim                 |           | 2         |           |           |           |           |           |           |           |           |           | 1         | 3          |
| Valentia Isl., Kerry                |           |           |           |           |           |           | 1         | 1         | 1         |           |           | 1         | 4          |
| Whitehead, Antrim                   |           | 1         |           |           |           |           |           |           |           |           |           | 1         | 2          |
| Wicklow Head, Wicklow               |           | 1         |           |           |           |           |           |           |           | 1         |           | 1         | 3          |
| <b>Total No. Effort Watches</b>     | <b>30</b> | <b>41</b> | <b>51</b> | <b>43</b> | <b>43</b> | <b>30</b> | <b>33</b> | <b>16</b> | <b>23</b> | <b>27</b> | <b>21</b> | <b>43</b> | <b>401</b> |
| <b>Total No. Effort Sightings</b>   | <b>19</b> | <b>60</b> | <b>55</b> | <b>55</b> | <b>33</b> | <b>38</b> | <b>34</b> | <b>13</b> | <b>32</b> | <b>26</b> | <b>29</b> | <b>39</b> | <b>433</b> |

**Table 6. Number of watches carried out at 12 key inshore monitoring sites during 2006/7**

| Site                       | 2006 |   |   |    |   |   |   |   | 2007 |   |   |    | Total |
|----------------------------|------|---|---|----|---|---|---|---|------|---|---|----|-------|
|                            | M    | J | J | A  | S | O | N | D | J    | F | M | A  |       |
| Howth Head, Co Dublin      | 2    | 2 | 1 | 1  | 1 | - | 1 | - | -    | - | 2 | 2  | 12    |
| Hook Head, Co Wexford      | -    | 1 | 1 | -  | 1 | 1 | 1 | - | -    | 1 | - | -  | 6     |
| Ardmore Head, Co Waterford | 6    | 4 | 4 | 5  | 4 | 3 | 2 | 3 | 4    | 4 | 2 | 4  | 45    |
| Galley Head, Co Cork       | 1    | 1 | 1 | 1  | 1 | 3 | 3 | 1 | 1    | - | 1 | 1  | 15    |
| Castle Point, Co Cork*     | -    | 1 | 1 | 1  | 1 | 1 | 1 | 1 | 1    | 1 | 1 | 1  | 11    |
| Slea Head, Co Kerry*       | 5    | 5 | 8 | 12 | 6 | 3 | 5 | 1 | 3    | 1 | 2 | 11 | 62    |
| Loop Head, Co Clare        | 1    | - | - | 1  | 2 | 3 | 2 | 1 | 1    | 1 | 1 | -  | 13    |
| Black Head, Co Clare       | 1    | 1 | - | -  | 1 | 1 | 1 | - | 1    | 2 | - | 2  | 10    |
| Downpatrick Head, Co Mayo  | -    | 1 | 1 | 1  | 1 | 1 | 1 | - | -    | - | - | -  | 6     |
| Malin beg, Co Donegal      | -    | 2 | 2 | -  | 1 | 1 | 1 | - | -    | - | - | -  | 7     |
| Dunree Head, Co Donegal    | -    | 1 | 1 | -  | 1 | 1 | 1 | 1 | 1    | 1 | 1 | 1  | 10    |
| Ramore Head, Co Antrim     | 2    | 3 | 4 | 2  | 3 | 3 | 1 | 1 | -    | 2 | 3 | 4  | 28    |
| Portmuck, Co Antrim        | 2    | 1 | - | 1  | - | - | 1 | - | -    | 1 | 1 | 1  | 8     |
| Bloody Bridge, Co Down     | 2    | 2 | 3 | 1  | 1 | 2 | 1 | 2 | 2    | 2 | 2 | 3  | 23    |

2.3 We have identified 14 inshore monitoring sites (3 in Northern Ireland) where we attempt to obtain at least one watch per month. These watches are carried out with a strict protocol (Appendix III) in an attempt to reduce some of the variables. Primary observers have been identified for each site and wherever possible these observers are the same to reduce inter-person variability. At some sites there are secondary and additional observers identified in order to ensure good coverage. At the two cSAC sites (Castle point and Slea Head) observers are paid to carry out one watch per month. It can be seen from Table 6 that good seasonal coverage has been achieved from at least ten sites.

**Table 7. Comparison between key monitoring sites 2005-2007**

| Locations                           | Effort Watches |            |
|-------------------------------------|----------------|------------|
|                                     | 2005/6         | 2006/7     |
| Howth Hd, Dublin                    | 9              | 12         |
| Hook Hd, Wexford                    | 10             | 6          |
| Ram Hd, Ardmore, Waterford          | 67             | 45         |
| Galley Hd., Cork                    | 21             | 15         |
| Castlepoint, Roaringwater Bay, Cork | 6              | 11         |
| Slea Hd, Kerry                      | 50             | 62         |
| Loop Hd, Clare                      | 4              | 13         |
| Black Hd, Galway Bay                | 16             | 10         |
| Downpatrick Hd, Mayo                | 9              | 6          |
| Malinbeg, Donegal                   | 5              | 7          |
| Dunree Hd, Lough Swilly, Donegal    | 6              | 10         |
| Ramore Hd., Antrim                  | 19             | 28         |
| Portmuck, Islandmagee, Antrim       | 11             | 8          |
| Bloody Bridge, Down                 | 13             | 23         |
| <b>Total</b>                        | <b>246</b>     | <b>256</b> |

### Roaringwater Bay

A total of 26 effort watches have been carried out from this site since January 2005, with 36.2 hours and 25 sightings. Three species (harbour porpoise, minke whale and common dolphin) have been recorded. There is watch effort throughout the year and sightings of harbour porpoise in 9 of these months. Sighting rate was highest in March. There are still too few watches carried out to determine any trends but good coverage is now being achieved with which to monitor this site for cetaceans and especially harbour porpoise.

**Table 8. Sighting rate of harbour porpoise from Castle point**

| Month     | Hours | Sightings | avg/hr | Animals  | avg/hr            |
|-----------|-------|-----------|--------|----------|-------------------|
| January   |       |           | 3.7    | <b>3</b> | 0.8 <b>10</b> 2.7 |
| February  |       |           | 3.2    | <b>1</b> | 0.3 <b>3</b> 0.9  |
| March     |       |           | 3.3    | <b>4</b> | 1.2 <b>10</b> 3   |
| April     |       |           | 3.8    | <b>1</b> | 0.3 <b>1</b> 0.3  |
| May       |       |           | 2.7    | <b>1</b> | 0.4 <b>2</b> 0.8  |
| June      |       |           | 4.3    | <b>4</b> | 0.9 <b>7</b> 1.6  |
| July      |       |           | 4.3    | <b>0</b> | 0 <b>0</b> 0      |
| August    |       |           | 2.7    | <b>2</b> | 0.8 <b>6</b> 2.2  |
| September |       |           | 3.7    | <b>1</b> | 0.3 <b>1</b> 0.3  |
| October   |       |           | 1.7    | <b>1</b> | 0.6 <b>1</b> 0.6  |
| November  |       |           | 1.5    | <b>0</b> | 0 <b>0</b> 0      |
| December  |       |           | 1.5    | <b>0</b> | 0 <b>0</b> 0      |

### Slea Head

A total of 177 effort watches have been carried out from this site since January 2005, with 343.2 hours and 307 sightings. Seven species (harbour porpoise, common, bottlenose and Risso's dolphin and fin, humpback and minke whale) have been recorded. There is effort and sightings in all months. Sighting rate of harbour porpoise is highest in the winter (December to February) and summer (June to August) (Table 3). Group size is greatest during the summer (July and August). These data provide excellent baseline for which to determine changes in sightings rate.

**Table 9. Sighting rate of harbour porpoise from Slea Head**

| Month     | Hours | Sightings | avg/hr | Animals | avg/hr |
|-----------|-------|-----------|--------|---------|--------|
| January   | 21.3  | 18        | 0.8    | 58      | 2.7    |
| February  | 15.2  | 9         | 0.6    | 45      | 3      |
| March     | 25.9  | 8         | 0.3    | 34      | 1.3    |
| April     | 42.8  | 11        | 0.3    | 25      | 0.6    |
| May       | 38.2  | 7         | 0.2    | 17      | 0.4    |
| June      | 29.7  | 14        | 0.5    | 44      | 1.5    |
| July      | 24.4  | 19        | 0.8    | 91      | 3.7    |
| August    | 30.8  | 16        | 0.5    | 134     | 4.4    |
| September | 32.4  | 7         | 0.2    | 31      | 1      |
| October   | 35.3  | 10        | 0.3    | 49      | 1.4    |
| November  | 21.4  | 5         | 0.2    | 17      | 0.8    |
| December  | 25.8  | 11        | 0.4    | 60      | 2.3    |

- 2.5. A review of cetacean records from Northern Ireland including recommendations concerning potential candidate Special Areas of Conservation was carried out. After consideration from EHS it is hoped that this will focus monitoring procedures in the future. At present the IWDG carry out regular effort watches at 3 sites in Northern Ireland.

## Work package 3

### IWDG Ship Surveys

#### Tasks:

- 3.1 to target seasons and areas with historically poor coverage
- 3.2 carry out four months of cetacean surveys on ships of opportunity each year
- 3.3 avail of opportunities on state research, commercial, naval and other vessels
- 3.4 consolidate existing ferry surveys and establish a new route from Northern Ireland
- 3.5 provide resources and training to volunteers willing to undertake ship surveys on behalf of the IWDG
- 3.6 encourage volunteers to avail of opportunities on Irish foreign vessel observer programme in Irish waters
- 3.7 Publish/Review Ship Survey data

#### Progress during ISCOPE II:

3.1 Surveys conducted in year one of ISCOPE II have targeted high priority areas for large whales (southwest Herring acoustic survey) as well as areas with low survey effort e.g. continental shelf slopes (FSS deep-water survey), deep water canyons (FSS deep water survey & NIOZ Canyons survey) and seasons with low survey effort (Rockall trough oceanographic survey & FSS northwest herring acoustic survey).

3.2 Ships surveys: Surveys under the ISCOPE II project funding commenced in September 2006 with the MI FFS Deepwater Fishery Survey, followed in October by the SW Herring Acoustic Survey. The FSS **Deepwater Survey** covered critical shelf edge and deepwater canyon habitat. It was hoped to identify the presence of beaked whales over deepwater canyon systems off the west coast and indeed a number of sightings of unidentified beaked whale species were made. One of the beaked whale sightings was thought to be of two breaching northern bottlenose whales while another was thought to be one of the *Mesoplodon* species; Sowerby's beaked whale Gervais' beaked whale or True's beaked whale. All beaked whale sightings occurred over deepwater canyon systems on the northern edge of the porcupine bank (Fig 4).

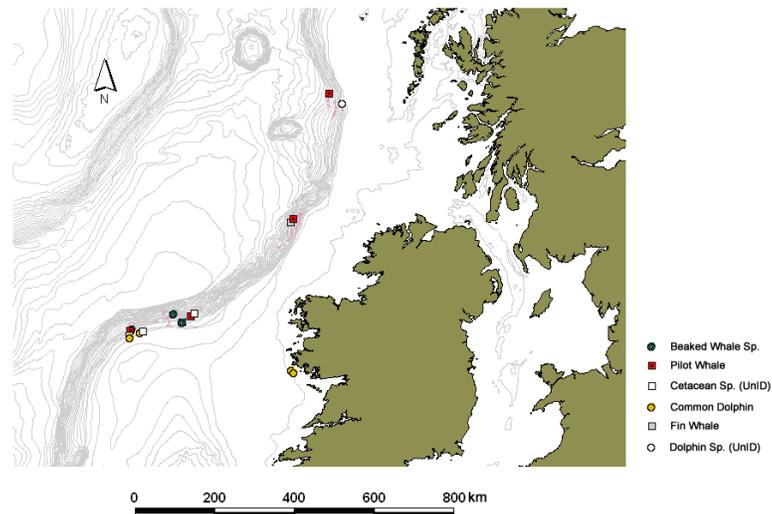


Figure 4. Sightings of cetacean species made during the 2006 Deep Water Fish Survey

The **FSS Celtic Sea Herring Acoustic Survey** covered a similar area to that surveyed in 2004 and 2005. Common dolphin was the most frequently sighted species, accounting for 74% of all sightings. Common dolphins were most frequently encountered off the south coast, where they were most abundant over the Labadie Bank. Seven minke whale sightings were made and they were the most frequently sighted whale species. All minke whale sightings occurred off the southwest coast, with highest abundance occurring in Dingle Bay. Five confirmed fin whale sightings were made, though six sightings of unidentified whale blows were also thought to be of this species. Fin whale sightings occurred off the southwest and south coasts (Fig. 5).

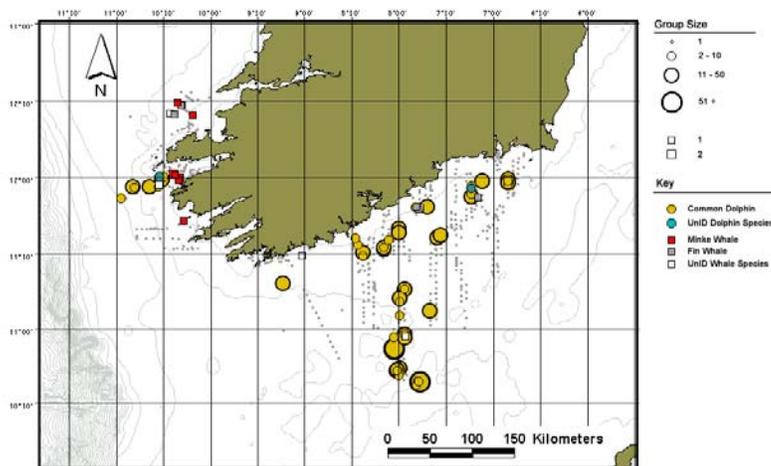


Figure 5. Sightings of cetacean species made during the 2006 Celtic Sea Herring Acoustic Survey

In January surveys were conducted on *RV Celtic Explorer* during the FSS Northwest Herring Acoustic Survey and the following Rockall Trough Oceanographic Survey while in June a survey was conducted on board the *RV Pelagia* during the NIOZ Canyons Survey. A single grey seal sighted c15 miles north of Rosses Point, Co Donegal was the only marine mammal sighted offshore during the survey **Northwest Herring Acoustic Survey**. Severe weather conditions prevailed throughout the entire survey, with the ship having to seek shelter in bays and harbours on a number of occasions. The lack of cetacean sightings during the survey is notable but not unexpected. During a summer survey in the same area in 2004, a very low relative abundance of cetaceans was recorded (Wall *et al.*, 2006) and a low relative abundance was also recorded in a cetacean survey conducted during the 2004 northwest Herring Acoustic Survey (IWDG 2004). Although the weather conditions were undoubtedly a factor in the zero sightings rate, common dolphins generally approach the vessel and would have been sighted despite the sea state, as would the blow of any large whales.

Three cetacean species – common dolphin, pilot whale and fin whale - were sighted during the **Rockall Trough Oceanographic Survey** (fig. 6). Additional sightings were made of unidentified dolphins (thought to be common dolphins) over the continental shelf. Sightings of dolphin species occurred over the continental shelf and porcupine bank whereas all pilot whale sightings occurred over the slopes of the continental shelf edge, which are considered the preferred habitat for this species. One whale

sighting occurred over the continental shelf and one in the Rockall Trough. Fin whales occur commonly off the south coast during the autumn and winter months but sightings of this species have been made off all Irish coasts and in offshore waters over the Rockall Bank. No sightings of cetaceans were made over the Rockall Bank, however survey conditions were not good during the period spent over the eastern edge of the bank slopes. Atlantic white-sided dolphins commonly occur in the waters over the Rockall Bank (Wall *et al.* 2006), however sightings tended to occur in shallower waters (< 350m) not covered during this survey.

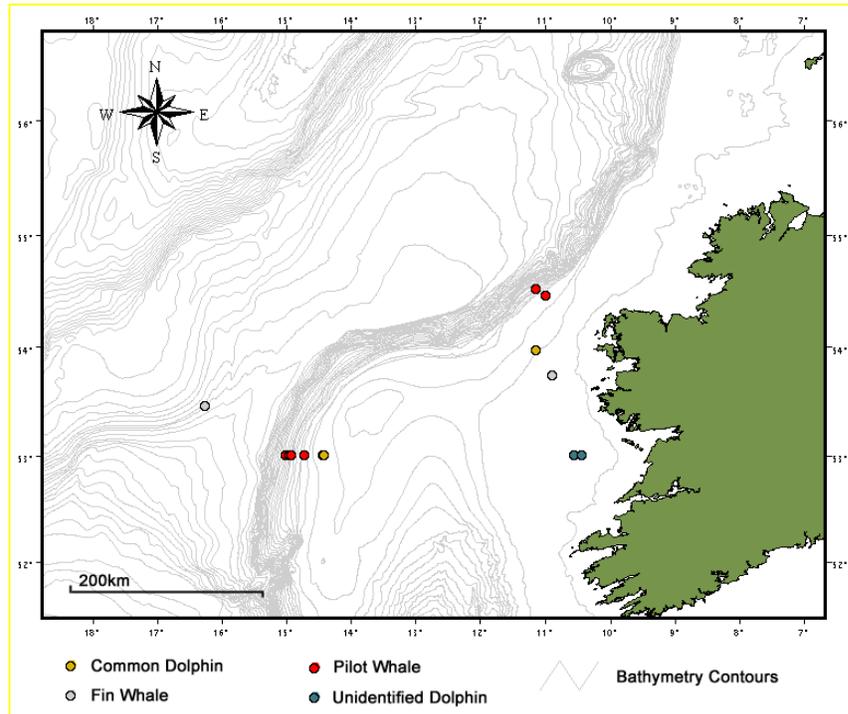


Figure 6. Sightings of cetacean species made during the 2007 Rockall Trough Oceanographic Survey

Identified cetacean species during the **NIOZ Canyons Survey** were Atlantic white-sided dolphin (*Lagenorhincus acutus*) and long-finned pilot whale (*Globicephala melas*). A sighting was also made of a small, unidentified breaching cetacean. The sightings rate recorded over the Whittard Canyon system was low when compared with Spanish and Portuguese waters also covered by this survey and adjacent waters over the Irish continental shelf (Wall *et al.* 2006). Modelling of beaked whale habitat preferences by MacLeod (2005) suggest that the Whittard Canyon system should be of high habitat value for a number of beaked whale species. Despite this, no sightings were made of beaked whale species during this survey. A previous survey over deep-water canyons to the north of the Porcupine Bank (also ranked as high value habitat in the model) yielded multiple beaked whale sightings despite poorer weather conditions (IWDG 2006). MacLeod acknowledges that the model is based primarily on benthic topography and other factors are likely to influence the use of deep-water canyon habitats by beaked whales.

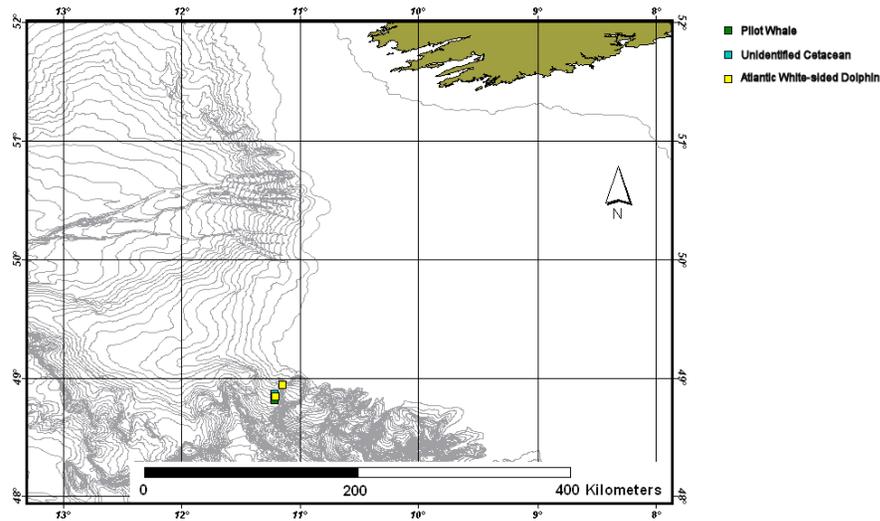


Figure 7. Sightings of cetacean species made within the Irish EEZ during the 2007 NIOZ Canyons Survey

A deep-water passive acoustic monitoring device (Deep POD) was deployed at a depth of 800m in 1600m of water depth during the survey (fig. 8). The POD recorded data on six of the eight days it was deployed. The majority of data appears to have been collected during the hours of darkness. A number of low frequency click trains (pulsed sounds emitted by cetaceans and some artificial sources) were recorded. Initial analysis shows that some of these click trains are from cetaceans, with pilot whales being the most likely candidate due to the long, slow nature of the click train (Nick Tregenza pers. comm.). The data also showed possible click trains from another cetacean source, however further analysis will be required to determine the origin of these click trains.

- 3.3 Berths have been booked for the following surveys in 2007 and the foreign vessel survey list is constantly reviewed for suitable survey platforms.

| <u>Survey</u>              | <u>Date</u>           | <u>Surveyor</u> |
|----------------------------|-----------------------|-----------------|
| Deepwater Survey           | 7 – 20 September 2007 | Dave Wall       |
| SW Herring Acoustic Survey | 12 Oct – 1 Nov 2007   | Dave Wall       |

It is also hoped to commence surveys with the Irish Naval Service during their whitefish patrols this coming winter.

- 3.4 Ferry surveys: The ferry surveys programme on the Irish Sea continues with three routes currently being surveyed: Larne/Cairnryan, Dublin/Holyhead and Rosslare/Pembroke. A new agreement with Irish Ferries has enabled us to target periods of good weather conditions, so as to maximise our sightings rates. This has already paid dividends with the June Dublin-Holyhead survey producing sightings of no less than 12 minke whales and 13 harbour porpoise. It is hoped that by conducting sightings in calm weather, volunteer surveyors will be enthused to continue their efforts. There is the prospect of re-opening the Rosslare to Cherbourg/Roscoff survey route as Irish Ferries is bringing in a new vessel on that route which is more suited to our needs. However

surveyor availability is an issue and the opening of a Rosslare/Roscoff route may necessitate closing the Pembroke route (one of the ARC partners is already covering the Fishguard/Rosslare route on Stenaline).

- 3.5 Provide resources: Through funding supplied by the Heritage Council capital grants in 2006 and 2007, has enabled the purchase of 3 laptops and 5 GPS receivers. These are now being supplied on all ferry routes. This will enable automatic position logging software to be used and will digitise the whole data collection process, thus speeding up the task of data collection during the survey and of data processing afterwards. We have also purchased two hand held GPS for use on whalewatching vessels acting as survey platforms. Padraig Whooley will use one on whalewatching vessels in West Cork and Mick O'Connell on vessels off west Kerry.
- 3.6 The IWDG conducted its first survey under the foreign vessel observer programme during May/June (see 3.2 for details). A survey of the Whittard Canyon System was conducted on board the Dutch ship *RV Pelagia* during the Royal Netherlands Institute for Sea Research Canyons Survey. A deep-water passive acoustic monitoring device (Deep POD) was deployed in 1600m of water during the survey.
- 3.7 IWDG involvement in the Pan-European Atlantic Research Coalition continues. Analysis of the 2002 and 2003 data from all ARC partners is underway and new modelling and data analysis techniques are to be used. The second ARC Report will present data on i) Species occupancy indices for each sea region ii) Cetacean multi-species indicators for each sea region, iii) Cetacean multi-species indicators for all regions combined, iv) Species distribution descriptions and distribution maps and v) Composite cetacean indices. It is hoped that funding may be sourced from DEFRA (UK) and other national conservation agencies to enable data to be analysed to develop 'cetacean biodiversity indicators for UK waters and EU waters'. Funding will enable the ARC partners to bring the databases up to date, incorporate additional datasets (Project Rugvin, Marinelife etc.), develop methodologies/analysis further and assess trends in cetacean abundance (occupancy) from 2001-2006.

ARC presented a poster, incorporating IWDG ferry survey data, on 'Annual Cetacean Monitoring at a European Scale' at the 2007 Conference of the European Cetacean Society in Spain (fig. 8). A paper entitled 'Using Passenger Ferries To Study Seasonal Patterns Of Minke Whale Occurrence In Northwest Europe', incorporating IWDG ferry survey data, was also presented at a workshop at the conference.

## **Work package 4**

### **Maintain cetacean database and develop monitoring indices**

#### Tasks

- 4.1 Validate all sighting and stranding records
- 4.2 Update and maintain database
- 4.3 Source historical and unpublished records including those stored outside of Ireland
- 4.4 Derive monitoring indices
- 4.5 Develop website and database
- 4.6 Develop co-ordination and data sharing with CeDaR in Northern Ireland
- 4.7 Liaise with the Biological Records Centre to assist the development of biological recording systems in the Republic of Ireland

#### Progress during ISCOPE II:

4.1 To date 1270 sighting and 144 stranding records, including 401 effort watches, have been received between May 2006 and April 2007, validated and the database populated.

4.2 See 3.2 and 4.1

4.3 An audit of the IWDG strandings database was carried out to identify unvalidated records. We identified 49 stranding unvalidated records dating back to at least 1998. Of these details sufficient for validation were obtained for 26 records, no details are available for at least seven records and we are still awaiting feedback for the remainder. We have deleted records that cannot be validated to ensure the IWDG Strandings database only includes validated records.

We have requested copies of any Irish cetacean sightings data held by the SeaWatch Foundation in the UK but have not received a formal response. It is likely that in order to obtain copies of these data will require the offices of the National Biodiversity Data Centre.

4.4 We completed a review of cetacean records in Northern Ireland to identify potential SACs for harbour porpoise and bottlenose dolphins. Copies of the IWDG cetacean database including all data collected to end of 2006 was submitted to CEDaR in Northern Ireland. This has enabled the IWDG to engage with EHS and other agencies/departments in Northern Ireland at an official level.

We have also completed a Conservation Assessment of all cetacean species occurring in Irish waters (24 species to date) as part of the NPWS reporting schedule on the Habitats Directive. This was the first round of reporting and difficulties in interpreting EU mapping requirements and assessment. However good experience was gained from the exercise, which has identified gaps in our knowledge. A Marine Megafauna Working Group has been established including representation from IWDG,

CMRC, UCC, Marine Institute, PAD and JNCC and chaired by NPWS to create a joint cetacean database for Ireland and develop future reporting requirements. This should greatly enhance our ability to provide Conservation Assessments in the future.

4.5 We have carried out an extensive upgrade of the database and website through a contract to Padraic Moran. The major change, which will not be evident to users, is switching from an Access based database to SQL Server. This provides increased stability, speed and security, necessary as the site has grown considerably in the last three years. There has been extensive work on the Manager for those of us who are updating sighting and stranding records and other content. This is invisible to the users but of great benefit to the managers and we hope make the updating of the site more efficient still. A number of new functions are now available. Many of these were requested by our funding agencies and IWDG members who regularly use the site. Summary tables of strandings and sightings now display the persons' name who reported the record and the Stranding Database can now be searched for live strandings. A new field to record the reference number for a genetic tissue sample if collected has been added. Under the Sightings Search facility you can now draw a box around the area of interest and display all sighting records within that box. For effort sites there is now information on the number of animals seen and group size to compliment the information on sighting rates. The map has also been enhanced to ensure greater accuracy within this map projection.

A new page, which we hope will be popular, is the Photo-ID page. Over the last few years the IWDG have been taking images of fin and humpback whales off the south coast of Ireland. These images are used to try and identify individual whales allowing us to monitor the movements of these whales both within a year, for example between Co Cork and Co Wexford, and between years to see if the same whales are returning. This same technique can be used for a range of species including common, Risso's and bottlenose dolphins. Extensive catalogues of bottlenose dolphins from the Shannon estuary exist (see [www.shannondolphins.ie](http://www.shannondolphins.ie)) as well as small catalogues from Galway Bay, Conamara, North Mayo and Donegal Bay. There has never been a match between these sites suggesting that dolphins occur in discrete areas. However, if more images are taken and examined we might actually find extensive movements of individual dolphins around the whole coast. Many people now have high quality digital cameras and are frequently in a position to obtain images of whales and dolphins. We hope by presenting the photo-ID catalogue on the website it will encourage more people to send us good images of whale flukes and dorsal fins for us to examine and try and track whale and dolphin movements.

Finally, we are now providing RSS feeds from the website. This is a relatively new and increasingly popular method of receiving news from websites of interest. You can now receive headlines from [www.iwdg.ie](http://www.iwdg.ie) without having to visit the site every time.

4.6 See 4.4

4.7 The IWDG present ISCOPE II at the opening of the National Biodiversity Data Centre in Waterford on 18 January 2007. This included promotional material and demonstration of the website and on-line recording. The IWDG has also made submissions to the Dun Láoghaire-Rathdown, Galway and Mayo Local Biodiversity Action Plans under the ISCOPE project.

4.8 The IWDG have also continued to participate with the Strategic Environmental Assessment (SEA) process by joining the steering group of the Irish Offshore SEA 2, which is considering the Porcupine Bank.

### **Deliverables and Targets**

As many resources including promotional and recording material are already available from ISCOPE, the target deliverables are aimed more at specific areas and better interpretation of the data.

The project deliverables include:

- i) Target 10 newspaper articles, 10 radio interviews and two TV items per annum.
- ii) Target 40,000 website requests per month and 1,200 members by the end of 2008.
- iii) Target to record 200 strandings and 1750 sightings per annum by 2008.
- iv) More extensive geographical and seasonal sightings effort in waters >12nmls offshore
- v) monthly effort watches at 10 key sites (including the two harbour porpoise cSAC)
- vi) monthly effort watches at two sites in Northern Ireland
- vii) Develop a procedure to derive annual monitoring reports for Annexed species and within cSAC
- viii) Present results from ISCOPE at one national and one international conference per annum
- ix) Participate in international research consortiums
- x) Work with state agencies and academic institutions to formalise a National Cetacean database
- xi) Prepare a review for Northern Ireland with recommendations for MPAs
- xii) Prepare a draft conservation assessment of all cetacean species recorded in Irish waters
- xiii) Continue to participate in the SEA process

### Media coverage

Huge media coverage of cetaceans this summer including a live stranded pilot whale in Co Kerry, dead stranded humpback whale in Inverin, Co. Galway and sperm whale in Sligo (all with TV as well as radio and newspaper coverage) and the sei whale in Larne Lough has increased the profile of the IWDG and cetacean recording (note massive increase in website requests in July 2006 – nearly doubled in one month, which was largely due to the sei whale in Larne Lough).

## Website

The use of the website during 2006 is shown in Fig 6. Website reports were deleted by our service provider since November without informing the IWDG. This has now been corrected but it means we have no access to the standard statistics we have used to monitor use of the site.

The number of unique requests is fairly stable between 20-25,00 per month. The large peak in July corresponded with the week of 23 July, which was due to the huge media coverage of the sei whale stranded in Larne lough, Co Antrim. Interestingly despite this huge increase in use of the website there is no evidence of any new members for the IWDG. We have changed the homepage to include a prominent banner on “How to join the IWDG”. We also feel that few people are aware or use the on-line sighting and stranding database. We are considering producing a small (A4) flier on the site and the information available to encourage more people to access it.

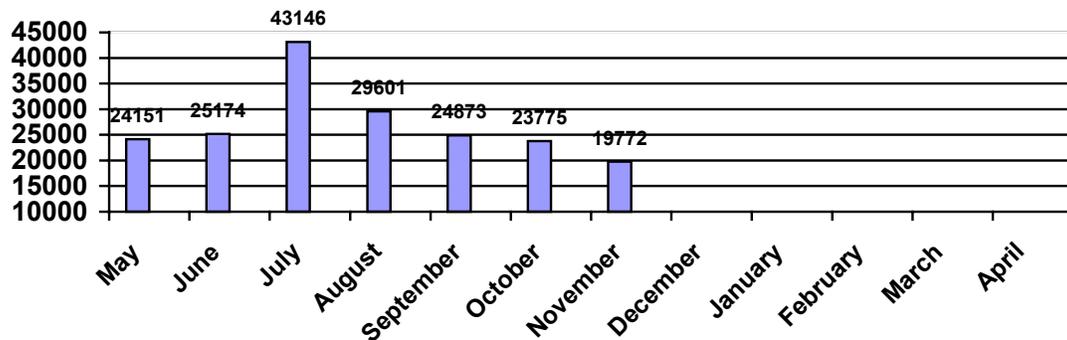


Figure 6. Number of page requests per month from January to November 2006

## Presentations

ISCOPE recording methods and dissemination was presented at the Irish Ship Operators Meeting at the Marine Institute on 24 October 2006. We also promoted the Ferry surveys at the European Cetacean Society conference in Santiago, Spain in April 2007 (see poster in Appendix II).

## Publications

The following publications have been accepted:

- Berrow, S. Massett, N. and O'Brien, J. (2006) Humpback whale *Megaptera novaengliae* off Cos Kerry and Galway. Irish Naturalists Journal 28(8), 339-340.
- Whooley, P. and Steele, P. (2006) Sei whale *Balaenoptera borealis* (L.). Irish Naturalists' Journal. 28(8), 339-340.
- O'Brien, J. and Berrow, S. (2006) Seaweed ingestion by a bottlenose dolphin *Tursiops truncatus*. Irish Naturalists Journal 28(8), 338-339.
- Berrow, S.D. & O'Brien, J. (2006). Scoliosis in bottlenose dolphins *Tursiops truncatus* (Montagu) in Ireland. Irish Naturalists' Journal 28(5), 219-220.
- Santos, M.B., Berrow, S.D. and Pierce, G.J. (2006) Stomach contents of a sperm whale *Physeter macrocephalus* calf in Co Clare (Ireland). Irish Naturalists' Journal 28(7), 272-275.

## Accounts

During this period we have changed Treasurer from Phyllis Ryan to George Delaney. George uses a different software package and the accounts presented are using Phyllis spreadsheet. Future accounts will be presented differently. A full breakdown of expenditure is presented in Appendix IV. A summary of the indicative budget is also presented in Table 10. During the period we have under-spent by €5,000 mainly due to reduced phone expenses and fewer training courses delivered than predicted. We have yet to source historical records (WP4.3).

**Table 10. Summary accounts and indicative expenditure for the period May 2006- April 2007**

| Task              | Who   | Item  | Spent         | Allocated     | Available      |
|-------------------|-------|---|---------------|---------------|----------------|
| <b>Manager</b>    | SB    | (12 days @ 200 pd)                                | 2400          | 2400          | -              |
|                   |       | Printing final report                             | -             | -             | -              |
| <i>Sub-total</i>  |       |   | <b>2400</b>   | <b>2400</b>   | -              |
|                   |       | Telephone @ 300 per month                         | 1493          | 3600          | 2,107          |
|                   |       | Sundries (incl. postage) @ 300 per month          | 3386          | 3600          | 214            |
|                   |       | Equipment   | 2359          | 2000          | (359)          |
|                   |       | Insurance   | 1815          | 2000          | 185            |
| <i>Sub-total</i>  |       |   | <b>9053</b>   | <b>11,200</b> | <b>2,147</b>   |
| 1.1/2.1           | SB/PW | Promote ISCOPE (10 days @ 200 pd)                 | 2000          | 2000          | -              |
| 1.2/2.2           | SB/PW | Training courses (12 days @ 200 pd)               | 1300          | 2400          | 1,100          |
|                   |       | Travel expenses @ 400 per month for 9 months      | 3122          | 3600          | 478            |
| <i>Sub-total</i>  |       |   | <b>6422</b>   | <b>8,000</b>  | <b>1,578</b>   |
| 2.4               | Con   | Monitor cSACs (24 days at 200 pd)                 | 4600          | 4800          | 200            |
|                   |       | Expenses @ 50 pd                                  | 1241          | 1200          | (41)           |
| <i>Sub-total</i>  |       |   | <b>5841</b>   | <b>6,000</b>  | <b>159</b>     |
| 3.1               | DW    | Field work @ 3000 per month (for 4 months)        | 11266         | 12000         | 734            |
|                   | DW    | Expenses @ 250 per month (for 4 months)           | 507           | 1000          | 493            |
|                   | DW    | Co-ordinate ferry surveys (4 days @ 200 pd)       | 800           | 800           | -              |
| 3.2               | DW    | Data entry and reporting (6 days @ 200 pd)        | 1200          | 1200          | -              |
| <i>Sub-total</i>  |       |   | <b>13773</b>  | <b>15,000</b> | <b>1,227</b>   |
| 4.1               | PW    | Validate records @ 200 pd <sup>1</sup>            | 6170          | 5800          | (370)          |
| 4.2               | PW    | Maintain database @ 200 pd <sup>1</sup>           | 5830          | 5400          | (430)          |
| 4.3               | SB    | Derive monitoring indices (10 days @ 200 pd)      | 2000          | 2000          | -              |
|                   | SB    | Sourcing historical records (10 days @ 200 pd)    | 600           | 2000          | 1400           |
| <i>Sub-total</i>  |       |   | <b>14,600</b> | <b>15,200</b> | <b>600</b>     |
| <b>Others</b>     |       |   |               |               |                |
| Dissemination     | All   | Presentation at conferences/seminars              | <b>859</b>    | <b>1,500</b>  | <b>641</b>     |
| Website           | PM    | Website and database management (5 days @ 400 pd) | <b>3150</b>   | <b>2,000</b>  | <b>(1,150)</b> |
| Accounts          | PR    | 12 days @ 200 pd                                  | <b>2400</b>   | <b>2,400</b>  | -              |
| <b>Total cost</b> |       |   | <b>58,498</b> | <b>63,700</b> | <b>5,002</b>   |

## **Appendix I: ISCOPE Steering Committee**

### **Members**

Environment and Heritage Service (Northern Ireland):

Gary Burrows

Irish Whale and Dolphin Group:

Simon Berrow (ISCOPE Co-ordinator)  
Mick O'Connell (Strandings Co-ordinator)  
David Wall (ShOPs Co-ordinator)  
Padraig Whooley (Sightings Co-ordinator)

Heritage Council:

Liam Lysaght (to December 2006)

Marine Institute:

Michael O'Conneide

National Parks and Wildlife Service:

David Lyons

# The Atlantic Research Coalition (ARC): annual cetacean monitoring at a European scale

Tom Brereton<sup>1</sup>, Colin MacLeod<sup>1,2</sup>, Dave Wall<sup>3</sup>, Pablo Cermeño<sup>4</sup>, Dave Curtis<sup>5</sup>, Kelly Macleod<sup>6</sup>, Clive Martin<sup>1</sup>, Jose Antonio Vazquez<sup>4</sup>, Cliff Benson<sup>7</sup>, Frank Zanderink<sup>8</sup> and Nynke Osinga<sup>8</sup>

ARC PARTNERS - 1 Biscay Dolphin Research Programme/Marinlife, 2 Aberdeen University, 3 Irish Whale and Dolphin Group, 4 Ambar, 5 Plymouth to Santander Marine Survey, 6 Organisation Cetacea, 7 Sea Trust, 8 Rugvin Foundation  
Correspondence - tom.brereton@marine-life.org.uk and c.d.macleod@abdn.ac.uk



## Policy context

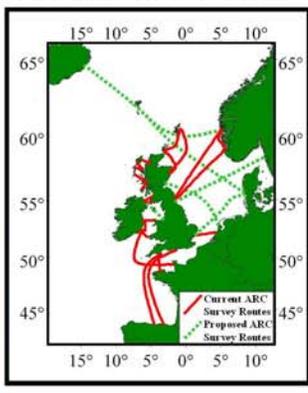
- Monitoring data is urgently required on cetacean status to assess the effectiveness of European Union (EU) legislation aimed at conserving and managing cetacean populations.
- In particular, the EU Habitat Directive requires surveillance and assessment at 6-year intervals of the conservation status (distribution and abundance) of all cetacean species, especially Harbour Porpoise and Bottlenose Dolphin in Marine Protected Areas (MPAs).
- Additionally, Biodiversity Indicators are required, especially for the marine environment, to assess progress in the EU target to halt biodiversity loss by 2010.
- Cetaceans are ideally placed to act as flagship indicators of the state of marine biodiversity due to their rapid and sensitive responses to habitat and climatic changes, and by being top predators, as representatives for the diversity and responses of other marine wildlife.

## ARC Aims

- ARC partners aim to address these data requirements, working together, to provide up-to-date distribution and abundance data at an EU scale, from data collected through dedicated, fixed, transect surveys using ferries as research platforms.

## ARC Partners

- ARC currently comprises eight research groups from six countries sampling over 20 routes since 1995.



## Benefits of the ARC approach

- Avoid duplication of effort
- Cost-effective (skilled volunteers)
- Consistent methodology
- Wide spatial coverage, including deep waters off the continental shelf
- Annual data collection to enable rapid and timely reporting
- Seasonal and temporal distribution and abundance data on ca20 species
- Potential to research climate change

## Current ARC projects- testing rapid data analysis methods

- Example:** Investigating using occupancy (occurrence) as a dual measure of distribution and abundance

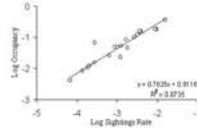


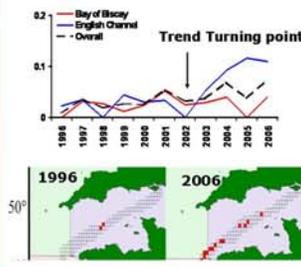
Fig. The relationship between relative abundance (sightings/km effort) and occupancy for 2002/03 ARC data using a 0.125° grid cell size.

## ARC projects – annual status reports

- Reports for north-west European waters include:
  - 2001 report produced
  - 2002/3 report in production

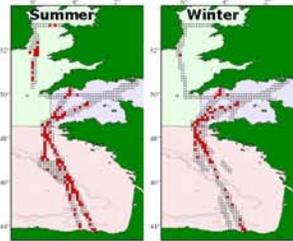
## ARC projects – assessing long-term changes in status

- Example:** Harbour Porpoise occurrence in the English Channel has increased in the summer months since the mid-1990s, consistent with results from Scans 2



## ARC projects – assessing seasonal distribution patterns

- Example:** Common Dolphin decrease in occurrence in Irish Sea and deep waters beyond the Celtic-Biscay shelf break in winter months.
- The result highlights vulnerability of the restricted distribution population, to winter shelf fisheries associated with bycatch



## Current ARC projects – testing development of a NW European Cetacean Indicator

- Example:** Log-linear and structural time-series modeling was used to combine annual status data from all-species, all ferry routes, all years, to generate trends over time in a multi-species cetacean index.
- Testing of this approach was made for 18 species over a 100,000km<sup>2</sup> survey area, from a subset of 2002/2003 data (Biscay-Celtic Sea).
- For individual species, no significant changes were noted between years.
- The multi-species index did not change significantly from 2002 to 2003 - status assessment, **stable**.
- Consistent inter-annual data within regions suggests high power to detect trends within EU reporting periods.

## Next stages

- Further analyses based on data from all routes 1995-2006.
- Encourage new partners, especially from Southern Europe.

## Acknowledgements

We would like to thank the many ARC surveyors who took part in the surveys. Also to the ferry companies who provided sponsorship.

### **Appendix III: Protocol for monitoring key inshore sites for cetaceans**

Under the ISCOPE II project, the Irish Whale and Dolphin Group (IWDG) have committed to carry out monitoring of key sites for cetaceans including the two Special Areas of Conservation designated for harbour porpoise (Roaringwater Bay, County Cork and the Blasket Islands, County Kerry).

#### **Field protocol**

We have committed to one watch per month at each site. We are trying to ensure all watches are carried out within the same week to minimize seasonal influences, thus watches are to be carried out in the same week. We are choosing the FIRST WEEK OF EACH MONTH

Each watch will be carried out only in sea-state 2 or less and a minimum of 6-10km visibility. If consistent unfavourable conditions persist, watches should be carried out on the NEXT AVAILABLE DAY with favourable conditions.

Watches will 100 MINUTES IN DURATION but would be terminated if sea-state increased to 3 or more or visibility decreased below 6km. The actual day within the first week of each month and time of day will be flexible to suit the observer.

Each observer should have BINOCULARS (at least 7x magnification) and a TELESCOPE (at least x20 eyepiece) to aid observation and identification.

All sightings will be recorded together with group size, behaviour and relative sizes of individuals. PLEASE RECORD EACH GROUP SEPARATELY. A group of cetaceans is defined as “all cetaceans within a 100m radius of each other”. There is an element of subjectivity in this as well as difficulties in judging distance. However, it is important to record different groups of the same species. For example; if there are 2 harbour porpoise 2km to the west and 4 harbour porpoise 6km to the north and the two groups are apparently not associating, then we would record these as two groups. In reality all cetaceans at a watch site are probably in acoustic contact but we need to distinguish different social groups if possible.

Please record BEARING to sighting from observers position (using a compass) and APPROXIMATE DISTANCE off, this will help us more accurately record the position of cetaceans. Record observers position on a map.

In addition the number, type and activity (if known) of all crafts (fishing vessels, yachts, jet skis etc) observed during a watch should be recorded, together with any other activity which might influence the distribution or behaviour of cetaceans. Environmental factors as per the yellow effort sheet will also be recorded.

#### **Observers**

Ideally one person would carry out all watches from a site with the same optical equipment. At some sites we might need to establish a team of observers. These will include IWDG staff, NPWS and EHS Conservation rangers and IWDG members. All observers will be given training on observing, identifying and recording cetaceans. It will be the responsibility of the IWDG to ensure the watches are carried out if favourable conditions prevail.

If an observer cannot carry out a watch for whatever reason, then we ask that IWDG are informed to enable us to find another observer to carry out the watch.

#### **Reporting**

Results are to be sent to IWDG each month and this will form part of our commitments under ISCOPE II. This new project will run from May 2006 to March 2009 and we hope to avoid too many changes in personnel during this period.

Data will be used to compile a conservation assessment for NPWS and EHS as part of their commitments under the EU Habitats Directive and hopefully develop into a long-term dataset to assess trends in the abundance of coastal cetaceans.

**Appendix IV: ISCOPE2 Funding May  
2006 to April 2009**

**Income**

| Date   | Details (name of group or individual) | € amount             | Dept of Environ (NPWS) | Heritage Council    | Marine Institute    | DOENI               |          |
|--|---------------------------------------|----------------------|------------------------|---------------------|---------------------|---------------------|----------|
| 03.08.06   | Dept of Environment (NPWS)            | € 36,000.00          | € 36,000.00            |                     |                     |                     |          |
| 13.02.07   | Marine Inst                           | € 10,000.00          |                        |                     | € 10,000.00         |                     | € 910.00 |
| 12.03.07   | EHS                                   | € 9,963.55           |                        |                     |                     | 9963.55             |          |
| <b>Funding Received</b>                                |                                       | <b>€ 55,963.55</b>   | <b>€ 36,000.00</b>     | <b>€ 0.00</b>       | <b>€ 10,000.00</b>  | <b>€ 9,963.55</b>   |          |
| <b>Funding Promised for three years May06 to Apr09</b> |                                       | <b>€ 198,000.00</b>  | <b>€ 108,000.00</b>    | <b>€ 30,000.00</b>  | <b>€ 30,000.00</b>  | <b>€ 30,000.00</b>  |          |
| <b>Funding Due</b>                                     |                                       | <b>-€ 142,036.45</b> | <b>-€ 72,000.00</b>    | <b>-€ 30,000.00</b> | <b>-€ 20,000.00</b> | <b>-€ 20,036.45</b> |          |

**Costs**

| Date     | Details (Payee)                      | € amount   | Overhead | Travel   | SAC Seminars | Whooley Sightings | Whooley Other | Berrow Co-ord | Berrow Other | Wall Ships | Wall Other | O'Connell Strandings | O'Connell Other | Cross check |
|----------|--------------------------------------|------------|----------|----------|--------------|-------------------|---------------|---------------|--------------|------------|------------|----------------------|-----------------|-------------|
| 24.05.06 | O2 Mobile Phone - Simon Berrow       | € 53.05    | € 53.05  |          |              |                   |               |               |              |            |            |                      |                 | € 53.05     |
| 13.05.06 | Padraig Whooley                      | € 39.26    | € 39.26  |          |              |                   |               |               |              |            |            |                      |                 | € 39.26     |
| 15.06.06 | R.M. Henry                           | € 1,815.23 |          |          |              |                   |               |               |              |            |            |                      |                 | € 1,815.23  |
| 23.06.06 | O2 Mobile Phone - Simon Berrow       | € 89.62    | € 89.62  |          |              |                   |               |               |              |            |            |                      |                 | € 89.62     |
| 26.06.06 | Padraig Whooley - May'06             | € 1,250.00 |          |          | € 250.00     | € 1,000.00        |               |               |              |            |            |                      |                 | € 1,250.00  |
| 26.06.06 | Phyllis Ryan - Apr06 - Jun06         | € 600.00   |          |          |              |                   |               |               |              |            |            |                      |                 | € 600.00    |
| 21.07.06 | Padraig Whooley (WOD & Fish Ireland) | € 1,925.00 |          | € 925.00 |              | € 1,000.00        |               |               |              |            |            |                      |                 | € 1,925.00  |
| 21.07.06 | Padraig Whooley - Jun'06             | € 1,317.22 | € 67.22  |          | € 250.00     |                   | € 1,000.00    |               |              |            |            |                      |                 | € 1,317.22  |
| 21.07.06 | Simon Berrow (WOD & Fish Ireland)    | € 1,545.76 | € 300.76 | € 445.00 |              |                   |               |               | € 800.00     |            |            |                      |                 | € 1,545.76  |
| 21.07.06 | Mick O'Connell - Jun'06              | € 250.00   |          |          | € 250.00     |                   |               |               |              |            |            |                      |                 | € 250.00    |
| 25.07.06 | O2 Mobile Phone - Simon Berrow       | € 59.59    | € 59.59  |          |              |                   |               |               |              |            |            |                      |                 | € 59.59     |
| 19.08.06 | Padraig Whooley - Jul'06             | € 1,322.45 | € 72.45  |          | € 250.00     | € 1,000.00        |               |               |              |            |            |                      |                 | € 1,322.45  |
| 22.08.06 | Mick O'Connell - Jul'06              | € 250.00   |          |          | € 250.00     |                   |               |               |              |            |            |                      |                 | € 250.00    |

|          |                                |            |          |            |            |            |            |            |
|----------|--------------------------------|------------|----------|------------|------------|------------|------------|------------|
| 29.08.06 | O2 Mobile Phone - Simon Berrow | € 65.11    | € 65.11  |            |            |            |            | € 65.11    |
| 07.09.06 | Padraig Whooley - Aug'06       | € 1,431.55 | € 181.55 | € 250.00   | € 1,000.00 |            |            | € 1,431.55 |
| 07.09.06 | Mick O'Connell                 | € 274.00   |          | € 274.00   |            |            |            | € 274.00   |
| 27.09.06 | O2 Mobile Phone - Simon Berrow | € 100.99   | € 100.99 |            |            |            |            | € 100.99   |
| 04.10.06 | Phyllis Ryan - Jul06 - Sept06  | € 600.00   |          |            |            |            |            | € 600.00   |
| 24.10.06 | O2 Mobile Phone - Simon Berrow | € 63.71    | € 63.71  |            |            |            |            | € 63.71    |
| 24.10.06 | Dave Wall                      | € 1,500.00 |          |            |            | € 1,500.00 |            | € 1,500.00 |
| 24.10.06 | Padraig Whooley - Sept06       | € 1,307.49 | € 57.49  | € 250.00   | € 1,000.00 |            |            | € 1,307.49 |
| 24.10.06 | D&A O' Leary                   | € 302.50   |          |            |            |            |            | € 302.50   |
| 24.10.06 | Mick O'Connell                 | € 316.83   |          | € 316.83   |            |            |            | € 316.83   |
| 15.11.06 | Mick O'Connell - oct'06        | € 250.00   |          | € 250.00   |            |            |            | € 250.00   |
| 15.11.06 | Padraig whooley - Oct'06       | € 1,593.01 | € 73.01  | € 70.00    | € 250.00   | € 1,000.00 | € 200.00   | € 1,593.01 |
| 15.11.06 | Simon Berrow                   | € 515.00   |          |            | € 515.00   |            |            | € 515.00   |
| 22.11.06 | O2 Mobile Phone - Simon Berrow | € 64.02    | € 64.02  |            |            |            |            | € 64.02    |
| 23.11.06 | Dave Wall                      | € 2,757.82 |          | € 507.82   |            | € 2,250.00 |            | € 2,757.82 |
| 03.12.06 | Mick O'Connell                 | € 250.00   |          | € 250.00   |            |            |            | € 250.00   |
| 12.12.06 | Padraig Whooley                | € 1,311.05 | € 61.05  | € 250.00   | € 1,000.00 |            |            | € 1,311.05 |
| 18.12.06 | Simon Berrow                   | € 800.00   |          |            |            | € 800.00   |            | € 800.00   |
| 31.12.06 | Mick O'Connell                 | € 450.00   |          | € 250.00   | € 200.00   |            |            | € 450.00   |
| 31.12.06 | Phyllis Ryan                   | € 600.00   |          |            |            |            |            | € 600.00   |
| 31.12.06 | Padraig Whooley                | € 1,466.58 | € 56.58  | € 160.00   | € 250.00   | € 1,000.00 |            | € 1,466.58 |
| 22.12.06 | O2 Mobile Phone - Simon Berrow | € 53.52    | € 53.52  |            |            |            |            | € 53.52    |
| 31.12.06 | Mick O'Connell                 | € 1,600.00 |          |            |            |            | € 1,600.00 | € 1,600.00 |
| 2007     | P Whooley ISCOPE Fee (4 mths)  | € 4,000.00 |          |            | € 4,000.00 |            |            | € 4,000.00 |
| 2007     | P Whooley Boat Show            | € 1,000.00 |          |            | € 1,000.00 |            |            | € 1,000.00 |
| 2007     | Dave Wall - Herring Survey     | € 2,250.00 |          |            |            | € 2,250.00 |            | € 2,250.00 |
| 2007     | Dave Wall - Rockall Trough     | € 1,125.00 |          |            |            | € 1,125.00 |            | € 1,125.00 |
| 2007     | Mick O' Connell Training       | € 100.00   |          |            |            |            | € 100.00   | € 100.00   |
| 2007     | Boat show furniture rental     | € 52.03    |          |            | € 52.03    |            |            | € 52.03    |
| 2007     | Boat show electrics            | € 91.96    |          |            | € 91.96    |            |            | € 91.96    |
| 2007     | SAC Monitoring (4 mths)        | € 2,000.00 |          | € 2,000.00 |            |            |            | € 2,000.00 |
| 2007     | Dave-Wall Ship Surveys         | € 1,875.00 |          |            |            | € 1,875.00 |            | € 1,875.00 |
| 2007     | Strandings co-ordinator 4 mths | € 666.40   |          |            |            |            | € 666.40   | € 666.40   |
| 2007     | D&A O'Leary                    | € 14.16    |          |            |            |            |            | € 14.16    |

|                                 |                                    |                    |                   |                   |                   |                 |                    |                   |                   |                   |                    |                 |                   |                 |                    |
|---------------------------------|------------------------------------|--------------------|-------------------|-------------------|-------------------|-----------------|--------------------|-------------------|-------------------|-------------------|--------------------|-----------------|-------------------|-----------------|--------------------|
| 2007                            | Fuel                               | € 83.70            |                   | € 83.70           |                   |                 |                    |                   |                   |                   |                    |                 |                   |                 | € 83.70            |
| 2007                            | Telephone                          | € 673.60           | € 673.60          |                   |                   |                 |                    |                   |                   |                   |                    |                 |                   |                 | € 673.60           |
| 2007                            | Travel                             | € 1,437.80         |                   | € 1,437.80        |                   |                 |                    |                   |                   |                   |                    |                 |                   |                 | € 1,437.80         |
| 2007                            | Padraic Moran                      | € 3,150.00         |                   |                   |                   |                 |                    |                   |                   |                   |                    |                 |                   |                 | € 3,150.00         |
| 2006/07                         | Treasurer fee G Delaney            | € 600.00           |                   |                   |                   |                 |                    |                   |                   |                   |                    |                 |                   |                 | € 600.00           |
| 2006/07                         | Co-ordinator costs                 | € 2,400.00         |                   |                   |                   | € 2,400.00      |                    |                   |                   |                   |                    |                 |                   |                 | € 2,400.00         |
| 2006/07                         | Conservation assessment - S Berrow | € 2,400.00         |                   |                   |                   |                 | € 2,400.00         |                   |                   |                   |                    |                 |                   |                 | € 2,400.00         |
| 2007                            | Digital projector                  | € 1,293.78         |                   |                   |                   |                 |                    |                   |                   |                   |                    |                 |                   |                 | € 1,293.78         |
| 2007                            | Digital Camera                     | € 1,065.00         |                   |                   |                   |                 |                    |                   |                   |                   |                    |                 |                   |                 | € 1,065.00         |
| 2007                            | Dave Wall - survey coordination    | € 800.00           |                   |                   |                   |                 |                    |                   |                   | € 800.00          |                    |                 |                   |                 | € 800.00           |
|                                 | Mick O'Connell phone calls         | € 360              | € 360             |                   |                   |                 |                    |                   |                   |                   |                    |                 |                   |                 | € 360              |
|                                 | Sundries                           | € 2,070            | € 2070            |                   |                   |                 |                    |                   |                   |                   |                    |                 |                   |                 | € 2070             |
|                                 | Dave Wall                          | € 1,200            |                   |                   |                   |                 |                    |                   |                   | € 1,200           |                    |                 |                   |                 | € 1,200            |
| <b>Total Costs To Date</b>      |                                    | <b>€ 58,896.79</b> | <b>€ 4,562.58</b> | <b>€ 3,629.32</b> | <b>€ 5,840.83</b> | <b>€ 858.99</b> | <b>€ 12,000.00</b> | <b>€ 2,200.00</b> | <b>€ 2,400.00</b> | <b>€ 4,000.00</b> | <b>€ 10,200.00</b> | <b>€ 800.00</b> | <b>€ 2,266.40</b> | <b>€ 100.00</b> | <b>€ 58,896.79</b> |
| <b>Funding received to date</b> |                                    | <b>€ 65,963.55</b> |                   |                   |                   |                 |                    |                   |                   |                   |                    |                 |                   |                 |                    |