

# Project MULTI01



Bord Iascaigh Mhara  
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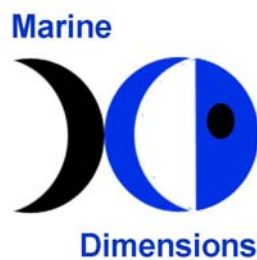
**Discover**  
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## Purse Search Ireland: A Shark and Ray Eggcase Sightings Scheme for Ireland



## Final Report Marine Dimensions, 2009



Version 1.1: Prepared by Sarah Varian, Marine Dimensions

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Dr Sarah Varian  
Director, Marine Dimensions

## SUMMARY

Purse Search Ireland is a project designed to raise public understanding and enjoyment of marine science, whilst also increasing our knowledge on the distribution and occurrence of shark, skate and ray nursery areas around the coasts of Ireland. The main aim of the project was to encourage people to report their observations of mermaids' purses, which are actually the eggcases of sharks, skate and rays. Eggcases can often be seen washed up on the seashore, sometimes indicating that there may be a nursery area close by. The project was launched at the Dublin Zoo Native Species Weekend in April 2007, with an extremely enthusiastic response from visitors attending the workshops associated with the event. Since then, the Purse Search Roadshow has visited many schools and biodiversity events around the country, with over 200 workshops given to at least 7000 people. The project was found to be particularly popular with schools participating in the Discover Primary Science Programme, with science classes reporting their project results in association with the Scientific Awards of Excellence. Press and media coverage have also been used to raise public awareness and the project featured in RTE's second series of *Living the Wildlife*. An effective 'drip feed' communications campaign (with workshops, press and media coverage carried out all year round) is considered to be a key element for the success of the project. Resulting observations of mermaids' purses are now regularly being reported online through the Purse Search project page and online recording form at [www.marinedimensions.ie](http://www.marinedimensions.ie), with many observers posting purses on to project scientists to confirm species identification. A total of 2127 purses from 10 species have been reported from 109 beaches over a period of two years and it is expected that observations of purses will continue to be reported in 2009. A number of beaches around Ireland's coastline have been highlighted as possible indicator sites (ie. where observations of numerous eggcases have been confirmed by scientists) as a result of volunteers' observations, including bays that may serve as nursery areas for several commercial species of ray (eg. Thornback Ray *Raja clavata*, Spotted Ray *Raja montagui*, Painted Ray *Raja microocellata* and Blonde Ray *Raja brachyura*), as well as more sensitive areas associated with rare or vulnerable species (eg. the Common Skate *Dipturus batis*, White Skate *Rostroraja alba* and the Undulate Ray *Raja undulata*). The popularity of the project continues to grow and many schools now include eggcase hunts in their annual nature programmes. Useful education materials developed through the programme include a field identification guide entitled *A Guide to Ireland's Egglaying Sharks and Rays*, with artwork and images depicting 10 inshore species and their eggcases.

## **SECTION 1: INTRODUCTION**

### **1.1 Background**

Purse Search Ireland was set up in 2007 with a view to raising public awareness of Ireland's sharks and rays, whilst at the same time improving information available for fisheries conservation management. The main aim was to encourage people to report their observations of mermaids' purses, which are actually the eggcases of sharks, skates and rays. These purses are laid by the adult female fish in a suitable habitat on the seafloor, with the young embryo developing within the eggcase for up to 15 months. The baby shark or skate then hatches out of the purse and swims away, leaving the discarded eggcase behind it. Eggcases can often be seen washed up on the seashore, frequently tangled up in seaweed along the upper shoreline. Observations of these purses on the seashore (and underwater) can be used to provide valuable information on the location of nursery areas. Such information is crucial for the management of fish populations that are sensitive to exploitation, such as the cartilaginous fishes.

The Purse Search project was originally inspired by a similar survey set up by the Shark Trust in 2001. This shark and ray sightings scheme, The Great Eggcase Hunt, pioneered the idea of using public observations of discarded eggcases as a method of collecting information on nursery areas in the UK. Purse Search Ireland has subsequently incorporated many of the elements of the Shark Trust's programme in its sightings scheme, although the Irish scheme has been modified and tailored to suit local requirements. Both sightings schemes have benefited from and depend on advances in online technology facilitating dissemination of information and online reporting options for volunteers.

Although the current project was initially designed to run for one year as a pilot (from April '07 to March '08), the project was extended for a second year due to the enthusiastic response received by schools and local communities nationwide. Funding was provided by Bord Iascaigh Mhara, the National Parks and Wildlife Service, The Heritage Council and Forfas Discover Science and Engineering during this time. School visits have also been subsidised through the Heritage in Schools Scheme (part funded by the Heritage Council and administered by the INTO) and the ENFO on Tour programme (funded by ENFO). Additional sponsorship for 2009 has been awarded by The Heritage Council (a local heritage grant) and PADI Project Aware, allowing continuation of the education element for a third consecutive year.

### **1.2 Objectives**

The key aims of the project were:

- To set up a Shark and Ray Eggcase Sightings Scheme for Ireland (aka *Purse Search Ireland*), that would contribute towards enhancing fisheries conservation and knowledge of Ireland's marine biodiversity. The programme would compliment other Irish Sightings Schemes such as iSCOPE (the Irish Whale and Dolphin Group) and The Irish Sea Leatherback Turtle Project INTERREG IIIA project in UCC.
- To develop education resources for marine environmental science in primary and secondary schools, incorporating opportunities for visual, audio and kinaesthetic learning through participation in fieldwork, classroom and online activities.
- To promote public interest in marine environmental science by developing a project that is both appealing and relevant in terms of subject matter and conservation objectives.

- To set up a pilot project that may be used to develop an infrastructure for other educational sightings schemes and related projects.
- To maximise reliability of observations and records of shark and ray eggcases so that resulting information could be used to support fisheries management and policy initiatives.
- To maintain all records in a database that would be easily transferable and readily accessible to other organisations and the general public through data exchange agreements.

## **SECTION 2: METHODS**

### **2.1 The sightings scheme**

The Purse Search Eggcase Sightings Scheme was set up in April 2007, at which time a system was designed for maximising public participation and ensuring quality of information collated through the project. A three phased approach was implemented (Table 1), involving a comprehensive education and outreach programme that was designed to stimulate and encourage volunteer observations. Observations resulting from discovery and exploration on the seashore were then managed through a reporting system that was specifically designed for managing and assessing information reported by volunteer observers.

### **2.2 Education and outreach**

One of the main aims of the project was to raise public understanding and enjoyment of marine science, prompting the need for an effective public awareness programme. Education and awareness were also crucial for the success of the eggcase sightings scheme, encouraging people to report their observations of purses on beaches. A comprehensive education and outreach programme was subsequently developed, including shark and ray workshops that were designed to target a wide audience through a schools programme, adult education programme and public events. Workshops were supported by education materials and website features that were specifically designed for the project. Press and media coverage were also used pursued, including radio and TV coverage.

#### **2.2.1 *The Shark and Ray Workshop***

A shark and ray workshop was developed for the education programme, including options for indoor and outdoor events. Workshop content was developed so that it could be adapted for all age groups, eg. the workshop props and slide show did not contain any text. The language of the tutor could then be adapted according to the learning level of the audience.

##### Indoor workshops

Indoor shark and ray workshops involved a slide show and samples of mermaids' purses, including live specimens (when available) of shark and ray embryos (ie. the mermaids' purses)

Table 1: The three phases of action experienced by volunteer observers participating in the Purse Search Eggcase Sightings Scheme.

Phase	Action	Outcome
1. Education and outreach	<p>Potential volunteer observers are informed about the project through:</p> <ul style="list-style-type: none"> <li>(a) school workshops</li> <li>(b) public outreach events</li> <li>(c) press and media coverage</li> <li>(d) flyers</li> <li>(e) website info</li> </ul> <p>Observers are asked to report their observations online through the Purse Search project page at <a href="http://www.marinedimensions.ie">www.marinedimensions.ie</a>. It is also requested that they post a sample of the purse on to the project scientists in order to confirm species identification.</p>	<p>Public awareness is raised. Approximately 7000 people per year are informed through face to face events, with many more informed through press and media coverage.</p>
2. Exploration and discovery	<p>Volunteers discover purses either:</p> <ul style="list-style-type: none"> <li>(a) incidentally on a beach walk or</li> <li>(b) intentionally through a beach survey</li> </ul>	<p>Learning is consolidated through outdoor exploration and discovery. Observations may or may not be reported to Marine Dimensions at this stage.</p>
3. Reporting	<p>Volunteers report their sighting online through a recording form or by post. The observation may be reported in one of three ways:</p> <ul style="list-style-type: none"> <li>(a) with no description, photo or sample of the purse,</li> <li>(b) with a description or photo of the purse, but no sample,</li> <li>(c) with a description and sample of the purse.</li> </ul> <p>Following receipt of the information, the project scientist e-mails the observer to give them the results of their report and to thank them for their participation.</p>	<p>The sightings are included in the Purse Search database and species identified are classified as either confirmed or unconfirmed, depending on the quality of information provided by the observer through actions (a)-(c):</p> <ul style="list-style-type: none"> <li>(a) is classified as unconfirmed,</li> <li>(b) may be classified as unconfirmed or confirmed, depending on the quality of information provided,</li> <li>(c) is classified as confirmed.</li> </ul>

could be seen with the live occupants still inside) (Fig. 1). A purse arts and crafts workshop was also developed for public events. This workshop involved artwork and design based on a 'mermaid's purse' theme (eg. childrens' necklaces made from ray eggcases) (Fig. 2).

### Outdoor workshops

Outdoor shark and ray workshops involved a search for purses on the seashore, including an introductory talk about the project on site. This workshop would ideally take place as a follow on from the indoor workshop.

## **2.2.2 *The Schools Programme***

A total of 213 shark and ray workshops were delivered to approximately 5865 pupils in 52 primary and 4 secondary schools around the country through the Purse Search schools programme. Visits were provided in association with the following education programmes and schemes:

### The Heritage in Schools Scheme

The Heritage in Schools Scheme offers a panel of heritage specialists who will, at the request of a teacher, visit a primary school to work directly with the children. Specialists are listed in the Heritage in Schools Directory, which is updated annually and sent to all primary schools in the country. The visit is part-funded by the school and the remaining fee plus expenses are funded by the Heritage Council. The Scheme is administered by the INTO.

### The Living Coasts Education Programme

The Living Coasts Education Programme was an initiative of the Living Coasts Living Seas project, which was a partnership project between Fingal County Council and Gwynedd County Council in Wales, co-funded under the ERDF INTERREG IIIA programme. The aim of the Living Coasts Living Seas project was to raise awareness of the ecological and recreational value of the marine and coastal environment of Fingal and Gwynedd by means of a comprehensive education and awareness programme developed for both counties.

### The Enfo On Tour Programme

The Enfo On Tour Programme was an environmental education programme that was set up by ENFO, Ireland's public environmental information service. A series of workshops with environmental themes were delivered to schools around the country in 2007.

### The RDS Science Live Series

The RDS Science Live series was developed to inspire science educators to find creative ways to encourage young people to see science as exciting, challenging and fun. The development of these unique demonstration lectures is made possible through the bursaries awarded annually by the Society with the support of the Discover Science and Engineering Programme. An RDS Science Live Series lecture, entitled *Marine Biodiversity: Life Beneath the Surface*, was developed in 2006, including information on mermaids' purses and Ireland's endangered sharks and rays. A series of these lectures was also given to the National Sea Life Centre in Bray in 2007, with sponsorship from the Heritage Council (through a local heritage grant) and the Marine Institute.





Figure 1: A Lesser Spotted Dogfish embryo in its eggcase (top left) and children observing purses and live specimens at the Dublin Zoo Native Species Weekend.



Figure 2: Children enjoying the Purse Search arts and crafts workshop at Fingal Biodiversity Day and the Dublin Zoo Native Species Weekend in 2008.

## The Discover Primary Science Programme

The Discover Primary Science Programme is an initiative of Discover Science and Engineering, an integrated national science awareness programme managed by Forfás on behalf of the Office of Science & Technology in the Department of Enterprise, Trade and Employment, with the specific aim of establishing a culture of scientific and technological innovation in Ireland. The Purse Search project was profiled in various Discover Science Centres' Discover Primary Science Programmes, including The National Sea Life Centre Bray, North Bull Island Nature Reserve and Galway Atlantaquaria.

### **2.2.3** *The Adult Education Programme*

The Purse Search project was highlighted through the following adult education courses and events:

- The Living Coasts Teachers' Training Day (which forms part of the Fingal County Council Living Coasts Education Programme).
- A lecture given by Sarah Varian to teachers in the Rathmines Church of Ireland College of Education as part of the INTO/Heritage Council Elective Module.
- Discover Primary Science teacher training days,
- The *SESE and the Sea* course run by the Marine Institute and the Galway Education Centre,
- Teacher training workshops given by Sarah Varian through the Heritage in Schools Scheme (eg. Loreto Bray NS, St Catherines Rush NS).
- The UCD Adult Education Centre's *Guide to Ireland's Seashore* course and *Guide to Ireland's Aquatic Life* workshops.
- The *Discover Iveragh Peninsula* workshops run by Marine Dimensions in Co. Kerry in 2007.

### **2.2.4** *Public events*

A number of public events took place in association with the shark and ray awareness programme:

- A shark and ray awareness event was held at the Dublin Zoo Native Species weekend in April '07, '08 and '09, with a two day weekend workshop and presentation given to the public.
- An all day workshop was given at the Fingal County Council Biodiversity Day event at Newbridge Demesne in May '07 and '08, with approximately 5000 people attending each year.
- Workshops were given at the Louth County Council Blue Flag Raising Days in 2007, including a touchpool and seashore safari.
- A shark and ray workshop and seashore safari took place on Derrynane Beach in Co. Kerry as part of Heritage Week in August '08, with support from Kerry County Council.
- A workshop was given to Ballyweelin National School in Sligo as part of *Give It a Swirl Day* (National Volunteering Day) in September '08. The event was coordinated by the Sligo Volunteer Centre (Volunteer Centres Ireland).

- A workshop and seashore safari took place in Skerries, Co. Dublin to celebrate World Oceans Day in June '09, with support from Comhairle Fo Thuinn, The Irish Underwater Council.
- A talk on sharks and rays is scheduled for Heritage Week in August '09 at the National Sea Life Centre Bray, with support from The Heritage Council and PADI Project Aware.
- The project was profiled on the An Taisce website during the 2007 National Spring Clean.

### 2.2.5 Education materials

A range of education materials were developed in order to promote the Purse Search project and raise awareness for Ireland's sharks and rays, including posters, fact sheets and a shark and ray eggcase identification guide.

#### Purse Search Poster/Flyer

A Purse Search poster/flyer was designed in the initial stages of the project, with 10,000 copies printed and distributed to potential interested parties, ie. Biodiversity Officers and Heritage Officers in local authorities, local environmental groups and NGOs, Heritage in Schools Scheme Specialists, project officers with INTERREG coastal awareness programmes (eg. the Clean Coasts project and the Living Coasts Living Seas project), SCUBA dive centres, clubs and surf schools. The poster was also given to children attending workshops through the Marine Dimensions Education Programme.

#### Identification Guide for Ireland's Egglaying Sharks and Rays

A draft identification guide for Ireland's egglaying sharks and rays has been developed, with artwork and images depicting adult fish and their eggcases. Entitled *A Guide to Ireland's Egglaying Sharks and Rays*, this 10 page folded B5 laminated field guide is similar in style to the Field Studies Council AIDGAP guides. The Field Studies Council AIDGAP format has been found to be extremely popular by students participating in Marine Dimensions seashore safaris and workshops. Funding for developing the guide has been provided by the Heritage Council's Marine and Coastal Committee, in addition to the support provided by the local heritage project and Purse Search sponsors. It is anticipated that the guide will be finalised in 2009, with a view to printing and publishing 1000 copies in 2010 with support from a Heritage Council Publications Grant. The Shark Trust's *Eggcases of Skate and Ray Identification Guide* is currently being used as a guide for volunteer observers.

#### Ireland's Shark and Ray Poster

Information on Ireland's egglaying sharks and rays and the Purse Search project was included in the recently published Heritage Council poster, *Ireland's Sharks and Rays*. A copy of the poster is included in the education pack provided to schools through the Marine Dimensions Education Programme.

#### Mermaid's Purse Factsheet

A Mermaid's Purse factsheet was published in Issue No. 44 of The Sherkin Comment 2007, developed by The Sherkin Island Marine Station in association with Marine Dimensions. A copy of the article is included in the education pack provided to schools through the Marine Dimensions Education Programme.

### 2.2.6 Website features

A dedicated Purse Search project page was set up on the Marine Dimensions website, including information on how to report sightings and identify purses to species level (<http://marinedimensions.ie/index.php?id=730>; there are also links for the project on the homepage; [www.marinedimensions.ie](http://www.marinedimensions.ie)). Links to existing online education resources, eg the Shark Trust and

Peter Bor's websites, were also made available on the Eggcase Identification page. Additional resources are being added to the site as they become available, eg. the Heritage Council poster, *Ireland's Sharks and Rays*, and the *Guide to Ireland's Egg-laying Sharks and Rays* field identification guide will soon be downloadable as pdf files.

### 2.2.7 Press and media coverage

#### Press

Press coverage was pursued and articles were published in the following publications and newsletters:

- The Sherkin Comment, '07.
- Discover Primary Science's Tenth e-Newsletter, '07.
- The Heritage Council's E-Zine, Oct. '07.
- Inshore Ireland, Dec. '07 and '08.
- The Marine Times, Jan '08.
- Woman's Way, June '08.
- The Independent, August '08.
- The Primary Times, '08.

Details of articles published in coastal newspapers are given below:

- Varian, S. *Sharks and rays in Irish waters*. Inshore Ireland. 2008. December Issue, pp. 16-17.
- Varian, S. *Purse Search Ireland: A new project raising awareness for Ireland's sharks, skates and rays*. The Marine Times. 2008. January Issue, pp. 22.
- Varian, S. *Join the hunt for mermaids' purses! Purse Search Ireland - A new public sightings scheme for shark, skate and ray eggcases*. 2007. The Sherkin Comment. Issue No. 44, p6.
- Varian, S. *Observing mermaids' purses*. Inshore Ireland. 2007. June Issue, p8.

#### Radio and TV

Radio and TV coverage were pursued and features were broadcasted on the following programmes:

- The Tom McGurk Show, RTE Radio 1 (April, '06)
- RTE Young Peoples TV, The Den: News2Day (April, '06)
- Mooney Goes Wild, RTE Radio 1 (April, '07)
- Radio Kerry (August, '08)
- RTE Young Peoples TV, The Den: ICE (May '09)
- The Living the Wildlife Nature series, RTE1 TV (June '09)
- Nationwide, RTE1 TV (Oct'09) to be confirmed

## 2.3 The reporting process

The reporting process was developed in order to prioritise quality of information, particularly in relation to species identification (Table 1). Although The Shark Trust's eggcase identification charts are available for interested observers, it was considered to be difficult for volunteers to identify species correctly without adequate training and experience. For this reason, the requirement for a project scientist to confirm species identification was incorporated into the reporting process. This involves the observer either posting a sample of the eggcase to Marine Dimensions or providing a good quality

photograph or description of the eggcase. Sighting reports that do not include adequate information are recorded as unconfirmed in the Purse Search database.

The Purse Search programme also encourages observers to report their observations using an online recording form ([http://marinedimensions.ie/Online\\_recording\\_form.869.0.html](http://marinedimensions.ie/Online_recording_form.869.0.html)), which has been designed and customised for use on the project. It is also available for use by observers as a hard copy by request from Marine Dimensions. A copy of the recording form is given in Appendix I.



## **SECTION 3: RESULTS**

### **3.1 Education and outreach**

#### **3.1.1 *The Shark and Ray Workshop***

The indoor and outdoor shark and ray workshops were extremely well received by the public, both in schools and at public events. The use of live creatures, including live embryo dogfish and rays still inside their purses, was found to be the most effective way of engaging interest and enthusiasm from all age groups (Fig. 1). The purse arts and crafts workshop was also found to be extremely popular at public education events (Fig. 2).

Outdoor workshops worked particularly well as a follow on from the introductory slide show and touchpool, with many schools deciding to include eggcase hunts in their annual nature programmes as a result. Eggcase hunts were also included in many biodiversity events and programmes, eg. the 2008 Heritage Week Derrynane Beach Day, the 2007 National Spring Clean, the 2008 Give It A Swirl Day etc. (Fig. 3).

#### **3.1.2 *The Schools Programme***

Although workshops were delivered through several programmes and schemes, some initiatives were found to be more appropriate for delivering an ongoing investigative science programme. In particular, the Heritage in Schools Scheme, Discover Primary Science Programme and Living Coasts Education Programme were found to be the most flexible and more sustainable in this regard. Other programmes were either short lived or lacked the subsidisation required for providing ongoing hands on support to teachers.

The Purse Search Programme was found to be particularly compatible with the Discover Primary Science Awards of Scientific Excellence, qualifying for Steps 2 (where a scientist is invited to the school) and 4 (where the school provides evidence of undertaking their own science project). Schools registered for the Awards were informed about the project through the quarterly [www.primaryscience.ie](http://www.primaryscience.ie) e-newsletter when the project started in 2007.

The project has also been very popular with schools participating in the Green Schools Programme, run by An Taisce and the local authorities, since Water is the main theme considered by schools in the third year of the programme.

#### **3.1.3 *The Adult Education Programme and public events***

Workshops delivered through the adult education programme were most popular with:

- (a) teachers interested in including the project in their school's nature programmes and
- (b) wildlife enthusiasts interested in participating in community based conservation initiatives.

Students attending the UCD Adult Education Centre's *Guide to Ireland's Seashore* course were most interested, with many individuals subsequently volunteering their time or working as assistants on the project. Volunteers recruited through the adult education programme were particularly keen to participate in public events. The project continues to be a popular option for graduates looking for work experience on a marine science project.



Figure 3: An outdoor Purse Search workshop and eggcase hunt that took place on Derrynane Beach in Co. Kerry as part of Heritage Week in 2008.



Numbers attending public events ranged from 30 to 5000, depending on the nature of the event. A notable increase in hits and online purse reports was observed on the Marine Dimensions website in association with the busier public events.

#### **3.1.4 Education materials and website features**

Education materials developed and tested through the Purse Search project are given in Appendix II (please refer to accompanying CD for pdf files). The Purse Search poster/flyer was found to be highly effective in raising awareness as it was cost effective to produce and could be easily distributed amongst workshop attendants. Other posters and fact sheets developed in association with the project (eg. the Heritage Council Maritime Series Shark and Ray poster and the Sherkin Comment Mermaid's Purse fact sheet) are likely to be used on a continuous basis in schools, even if the Purse Search project is discontinued, as copies are provided in the Marine Dimensions Education Programme education pack accompanying *The Wonderful World of the Seashore* marine wildlife workshops. This workshop is given to schools on an ongoing basis through the Heritage in Schools Scheme.

Although *A Guide to Ireland's Egg-laying Sharks and Rays* has yet to be finalised, it is likely that the guide will be in popular demand once it is published, since Purse Search volunteer observers have been regularly requesting shark and ray eggcase identification guides. Such requestees are currently provided with a copy of the Shark Trust's *Eggcases of Skate and Ray Identification Guide*. It is also likely that many volunteer observers have downloaded this publication directly from the Shark Trust website via the Eggcase Identification page on [www.marinedimensions.ie](http://www.marinedimensions.ie).

#### **3.1.5 Press and media coverage**

Although it is generally difficult to measure awareness raised through an education and outreach campaign, it was possible to infer a certain amount by monitoring daily hit rates on the Purse Search project page. The number of hits on the Purse Search website was seen to increase substantially in the days following publication of articles in the press and also immediately after the airing of radio and TV programmes. Of all the press and media coverage attracted to the project, the RTE Mooney Goes Wild radio programme and Living the Wildlife TV programme were the most powerful. For example, the Marine Dimensions website received 656 hits on the day after the Living the Wildlife programme was broadcasted (the site generally receives between 150 and 200 hits per day). However, this result would have been expected considering both programmes attract large audiences of nature enthusiasts. The dedicated articles in coastal newspapers were also found to be an effective means of raising public awareness.

### **3.2 The reporting process and public participation**

#### **3.2.1 Purse reports**

In all, 228 purse reports have been received from observers to date, with an observed increased in observations reported over the two year project period (67 observations or purses reported from April '07 to Mar '08 and 109 reported from April '08 to Mar '09). Of these reports, 67% of observers sent eggcases on to the project scientists for identification (improving quality of information), whilst a small percentage (2%) provided photographs. There have also been sightings of mermaids' purses underwater, with 2% of recording forms submitted by divers.

Results were found to be somewhat weather dependent, with more sightings reported during fine weather. This is to be expected, considering the fact that many sightings are likely to have been incidental in nature, coinciding with observers' recreational trips to the seashore. The bad weather

conditions experienced during the summers of 2007 and 2008 are likely to have affected the number of observations reported during this period.

It is expected that the rate of purse reports will continue to increase in 2009 (53 reports have already been submitted since March) due to greater public awareness resulting from the 2009 Shark and Ray Awareness Programme.

### **3.2.2 *Species identification and eggcase distribution***

A total of 2172 purses from 10 species of shark, skate and ray were identified from 109 beaches over a period of 24 months. Figures 4-13 show the distribution of eggcases around Ireland's coastline reported by volunteer observers for each species of shark and ray, whilst Table 2 indicates the frequency of eggcase sightings on beaches and numbers of eggcases identified for each species according to volunteer reports.

Of the 10 species of shark and ray eggcase recorded, the Lesser Spotted Dogfish was the most frequently reported and the most widespread (Fig. 4, Table 2). Spotted and Thornback Ray eggcases were also common and widespread, whereas other commercial species, such as the Small Eyed, Cuckoo and Blonde Rays, were not as frequently reported (Figs 6-10, Table 2). Eggcases from the Undulate Ray were only reported from beaches in Tralee Bay (Fig. 11).

There were only two confirmed sightings of White Skate eggcases and three confirmed sightings of Common Skate eggcases (Table 2). Purses from the critically endangered Common Skate were sighted at Inch, Waterville (confirmed) and Castlegregory (unconfirmed) beaches in Co Kerry, at Horse Island in Co. Clare (confirmed) and at Fallcaragh in Co. Donegal (unconfirmed) (Fig. 12). Purses from the rare and critically endangered White Skate were sighted at Fenit, Ballyheigue (confirmed) and Brandon (unconfirmed) beaches in Tralee Bay, Co. Kerry (Fig. 13). A live White Skate embryo is also known to have been collected from the Galway Bay area (exact location unknown) two years ago. The fish was brought to Galway Atlantaquaria and was hand reared in the aquarium.

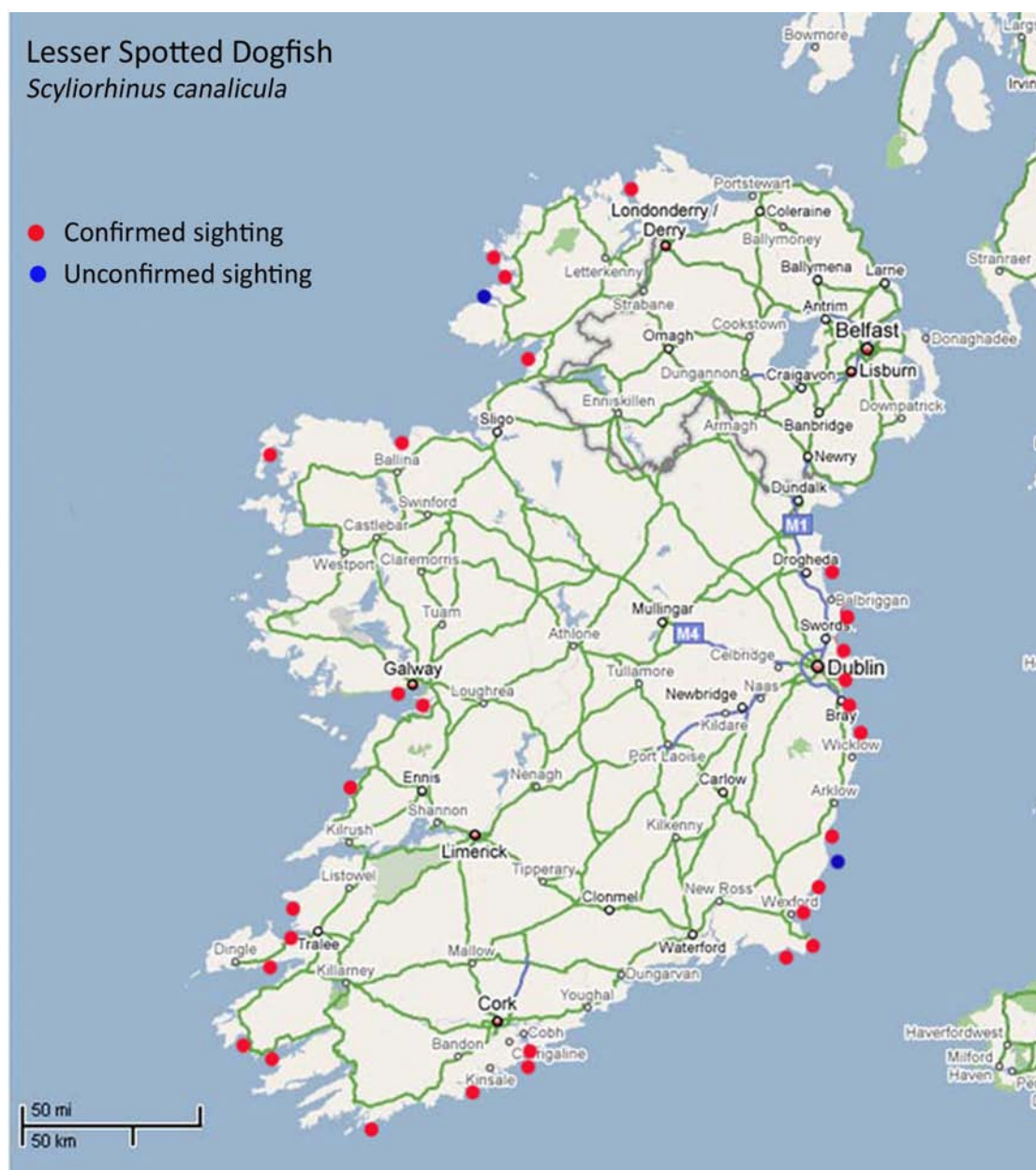


Figure 4: Distribution of Lesser Spotted Dogfish (*Scyliorhinus canalicula*) eggcases around Ireland's coastline reported by volunteer Purse Search observers between April 2007 and March 2009.

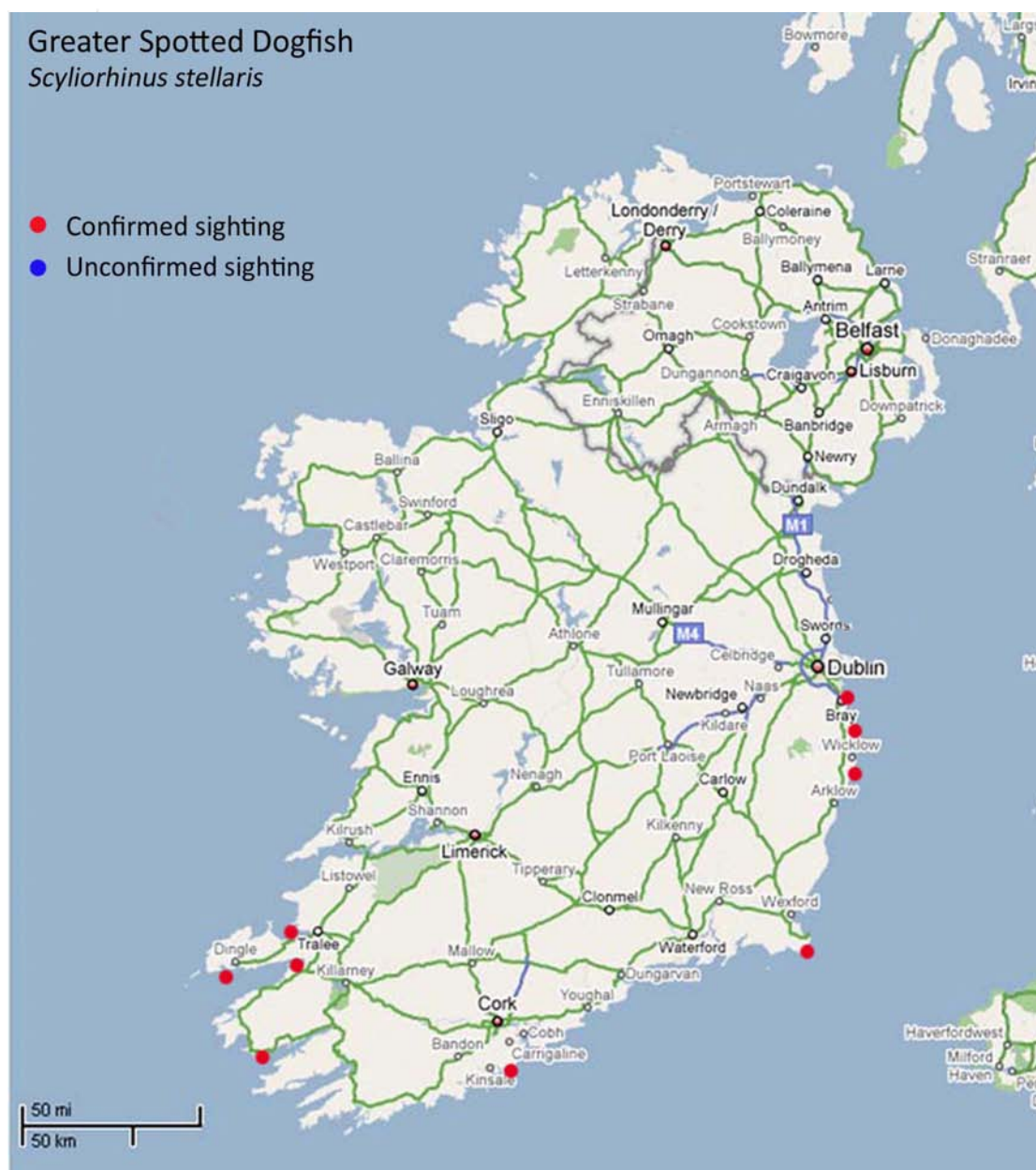


Figure 5: Distribution of Greater Spotted Dogfish (*Scyliorhinus stellaris*) eggcases around Ireland's coastline reported by volunteer Purse Search observers between April 2007 and March 2009.



Figure 6: Distribution of Thornback Ray (*Raja clavata*) eggcases around Ireland's coastline reported by volunteer Purse Search observers between April 2007 and March 2009.





Figure 7: Distribution of Spotted Ray (*Raja montagui*) eggcases around Ireland's coastline reported by volunteer Purse Search observers between April 2007 and March 2009.



Figure 8: Distribution of Blonde Ray (*Raja brachyura*) eggcases around Ireland's coastline reported by volunteer Purse Search observers between April 2007 and March 2009.



Figure 9: Distribution of Cuckoo Ray (*Leucoraja naevus*) eggcases around Ireland's coastline reported by volunteer Purse Search observers between April 2007 and March 2009.





Figure 10: Distribution of Small Eyed Ray (*Raja microocellata*) eggcases around Ireland's coastline reported by volunteer Purse Search observers between April 2007 and March 2009.



Figure 11: Distribution of Undulate Ray (*Raja undulata*) eggcases around Ireland's coastline reported by volunteer Purse Search observers between April 2007 and March 2009.



Figure 12: Distribution of Common Skate (*Dipturus batis*) eggcases around Ireland's coastline reported by volunteer Purse Search observers between April 2007 and March 2009.





Figure 13: Distribution of White Skate (*Rostroraja alba*) eggcases around Ireland's coastline Reported by volunteer Purse Search observers between April 2007 and March 2009.

Table 2: Frequency of eggcase sightings on beaches and total number of eggcases identified for each species according to volunteer reports. (Note: Each sighting represents a different beach, ie. repeat sightings are not included).

Species	Beach sightings (confirmed)	Beach sightings (unconfirmed)	Total eggcases (confirmed)	Total eggcases (unconfirmed)
Lesser Spotted Dogfish	29	2	1434	30
Greater Spotted Dogfish	9	0	29	4
Thornback Ray	10	2	537	16
Spotted Ray	13	2	89	4
Blonde Ray	4	1	9	0
Cuckoo Ray	1	1	1	0
Small Eyed Ray	4	0	11	0
Undulate Ray	3	0	10	1
Common Skate	3	2	3	13
White Skate	2	2	3	1

## SECTION 4: DISCUSSION

One of the main aims of the Purse Search project is to raise public understanding and enjoyment of marine science and wildlife. Thus, the enthusiastic response of the public towards the Purse Search public awareness programme has been extremely encouraging. The education programme in schools has been most successful, with many teachers deciding to incorporate eggcase hunts in their annual nature programmes as a result. One of the advantages of implementing the programme in schools has been its compatibility with the curricula and broader education programmes, such as the SESE curriculum, Discover Primary Science Programme, Green Schools Programme and Heritage in Schools Scheme. The subject matter is also appealing to students participating in the project; few children would turn down an opportunity to go to the beach for a day! The fact that shark and ray workshops can be booked through the Marine Dimensions Education Programme on a continual basis is also an advantage for teachers, since the visiting scientist can provide support and assistance with class activities.

The popularity of the Purse Search project has resulted in further funding being provided for the education element of the project, with funding received from The Heritage Council and PADI Project Aware to continue for another year with an associated project; *To develop a Public Awareness Programme for Ireland's Sharks and Rays*. The funding will be used to improve outreach materials available for raising public understanding and awareness of Ireland's sharks and rays, with particular emphasis on non egg-laying species that have not yet received attention through the Marine Dimensions Education Programme. There is a pressing need to raise awareness for species that bear live young, some of which are classified as critically endangered in the north east Atlantic by the World Conservation Union (eg. the spurdog *Squalus acanthias*, angel shark *Squatina squatina* and porbeagle shark *Lamna nasus*). The progress made to date through the Purse Search programme will provide a basis for developing a more comprehensive shark and ray public awareness programme in 2009.

The degree of public participation in the project compares extremely favourably with results reported by The Shark Trust for *The Great Eggcase Hunt* in the UK. In Ireland, a total of 2172 purses from 10 species of shark, skate and ray were identified from 109 beaches over a period of two years, in comparison with 1246 eggcases from 8 species identified from 41 locations in the UK recorded over a similar timeframe (2003-2004) (Shark Trust, Great Eggcase Hunt website; [www.eggcase.org](http://www.eggcase.org)). It is also appears that there will be a significant increase in observations reported to the Marine Dimensions offices in 2009 due to increasing awareness resulting from the project's communications campaign. This result most likely reflects the effectiveness of the shark and ray education and outreach programme, as well as the keen interest of the Irish public (particularly children and young people) in their marine environment and natural heritage.

The qualitative data collated through the Purse Search reporting system was found to support and compliment current scientific knowledge. For example, all three confirmed sightings for Undulate Ray eggcases were found in Tralee Bay. This supports the current opinion that Tralee Bay is the only coastal area where Undulate Ray occurs in Ireland (Norman Dunlop, Central Fisheries Board, *pers comm.*). Similarly, there have been no sightings of Common Skate from the east coast, supporting information that this species is commercially extinct in the Irish Sea (Went 1978; Gallagher et al, 2005a, 2005b). These results suggest that discarded shark and ray eggcases may not be travelling considerable distances from the juveniles' nursery area, supporting the idea that mermaids' purses may indeed be used as indicators for shark and ray nursery areas. However, it is clear that the oceanography and topography of an area would need to be explored in more detail before the precise location of a nursery area could be determined. The discarded purses are considered to be useful as a means of flagging areas that may warrant further investigation.

Although it was difficult to obtain true quantitative estimates for species due to difficulties associated with standardising surveys, some results were found to support current scientific knowledge. For

example, Lesser Spotted Dogfish and Thornback Ray eggcases were the most frequently reported species, reflecting the abundance of these species around Ireland's coasts (Ellis et al., 2005; ICES, 2005, 2006). Other species, however, such as Blonde Ray, Small Eyed Ray and Cuckoo Ray were not as common as expected. These results may be related to variation between species in the likelihood of discarded eggcases being washed ashore. For example, some species may lay their eggs further offshore than others, or in areas that are less likely to be affected by variation in oceanographic conditions. There are a whole range of physical parameters that may influence the transport of discarded eggcases that need to be explored further before observations of purses on beaches may be used effectively to estimate abundance and recruitment in shark and ray populations.

The confirmed reports of purses from the critically endangered Common Skate in Co. Kerry and Co. Clare and critically endangered White Skate and endangered Undulate Ray in Co. Kerry warrant further attention. EU Fisheries Ministers recently agreed to fully protect these species, adopting a science based proposal from the European Commission to ban the retention and mandate careful release of these increasingly rare species (Shark Alliance website, <http://www.sharkalliance.org/>). It is therefore extremely important that eggcase sightings for these species be investigated further, with a view to protecting nursery areas. Areas highlighted for commercial species also need to be investigated further with a view to improving sustainability of shark and ray fisheries.

## **SECTION 5: CONCLUSIONS AND RECOMMENDATIONS**

The Purse Search project has been a great success, with an eggcase sightings scheme that has been set up to maximise public participation whilst also ensuring quality of information collated. The three phased approach, which incorporates education and outreach, discovery and exploration and a scientific reporting process, has been a highly effective way of combining promotion of public understanding and enjoyment of marine science with fisheries research and management objectives.

The continued interest from sponsors in funding marine environmental education projects is encouraging. However, funding is also required to further investigate results obtained through the project's survey work, especially information that relates to improving fisheries conservation management in Ireland and at the EU level. It is recommended that future related projects should consider the following objectives:

- (i) To further investigate beaches/coastal areas that have been identified as being possible nursery areas for shark, skate and ray species, particularly those areas that may be important for threatened species, such as Common Skate, White Skate and Undulate Ray.
- (ii) To conduct a survey of current practice in the fishing industry relating to inshore sharks, skates and rays, particularly in relation to those species that are classified as threatened or rare. For example, there are reports that agreements between commercial fishers and chartered recreational fishing boats have increased protection for the Common Skate in some areas, with the return of commercial catches benefiting sea angling tourism (Norman Dunlop, CFB, *pers comm.*, ICES 2005). This fishing practice needs to be investigated further.
- (iii) To conduct a literature review of scientific information relating to inshore shark, skate and ray species in Ireland, including an assessment of the conservation status for all species.
- (iv) To ultimately compile Species Action and Management Plans for inshore shark, skate and ray species in Ireland, particularly those that have been identified as being endangered by the IUCN.

Although funding is required in the short term for many of the requirements outlined above, it is envisaged that the areas of scientific interest should be addressed incorporating a phased approach as information becomes available. For example, Species Action and Management Plans should not be developed until sufficient information becomes available following completion of (i), (ii) and (iii). A timeframe of approximately three years is suggested for this work to be completed.

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Appendix I: A copy of the online purse recording form used by Purse Search volunteer observers to report their sightings on [www.marinedimensions.ie](http://www.marinedimensions.ie).



## Report Your Sightings Here

### Contact details

Please note that information marked with an asterisk (\*) is required.

Name\*:

Email\*:

Telephone:

Address\*:

### Sighting Details

When did you find the Mermaid's Purse?

Sighting date:

Where did you find the Mermaid's Purse?

Sighting location (incl OS coordinates)\*:

County\*:

Did you find the Purse on a

(a) rocky shoreline?

☒

(b) sandy shoreline?

☒

(c) a mix of rocky and sandy shore?

☒

How many Purses did you find\*?

Approximately how many metres of shoreline did you survey\*?

Was there any evidence of the baby shark or ray still inside the purse?

☒

Additional comments:

Have you sent us a sample of the Purse by post?

☒

If you haven't sent us a sample, please give us a detailed description below:

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Appendix II: Education materials developed and tested through the Purse Search project (hard copies enclosed, pdf files on CD).