SHERKIN COMMENT

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Photograph by Robbie Murphy

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MARINE RESEARCH: A Need to Listen

By Matt Murphy

IN the past decade marine research in Ireland has received major funding from both government and the EU. I believe it is time that an in-depth independent examination be undertaken into how that funding has benefited the Nation and how we should be spending the funds that will be available in the coming years. One must ask have we been getting value for that investment. Has there been consultation as to what is needed? Has there been duplication? Is the funding being spread between too many bodies/institutions?

It must be pointed out that EU funding will be more difficult now with the enlargement to 25 member countries. There will not be a pro-rata increase in the finances being dispensed. Already researchers are finding it much more difficult to access EU funds. The waters, both coastal and offshore around Ireland have huge economical potential, both environmentally and industrially. We have failed miserably to bring to fruition their full potential. I would suggest a major factor has been a lack of cohesion between the various bodies who disperse the funding, with the finger pointing mostly at the Marine Institute. There is a definite lack of consultation between the latter and others.

Indeed there is general disquiet that the Marine Institute is losing touch with reality and the interests it is supposed to serve. There is a belief that they are attempting to dominate the whole research area because they control most of the marine funding for research. It is essential that they consult fully with other bodies, institutions and especially the fishing industry as to what these people, who are at the coalface, believe is needed in research.

Never in the history of the Irish State has so much funding been made available for marine research. Therefore it is imperative that the right projects are funded and the monies not wasted, whether it be from academia or institutions, including the Marine Institute's own scientific research teams.

Annually a large amount of funding is allocated to the operation of the Marine Institute's two research vessels: The Celtic Voyager and The Celtic Explorer. Questions need to be asked as to whether too many projects are being fitted into their annual programmes. It has been suggested that there may be an attempt to please as many people as possible. There is a view that more ship time should be allocated to a project so that the maximum benefits can be derived from the time at sea. There is a believe that some projects

Photo: © Paul Kay

being carried out by the two vessels would be better undertaken by commercial vessels especially with regard to fish stocks. It would be more economical and so more essential data could be gathered without extra cost.

What consultation is there between the Marine Institute and other state bodies such as BIM, who have the role of developing and marketing Ireland's seafood. They, with Udaras na Gaeltachta, also fund development and applied research in aquaculture. Do the three bodies meet annually on an equal basis to agree on what research is necessary? As important are the views of the fishing industry. Scientists worldwide rarely consult fishermen as to what research is needed yet they have huge knowledge of the stocks in the sea. Maybe we should take a leaf from the fishermen and scientists in Nova Scotia, Canada, who meet regularly to agree projects and then work together to undertake the research.

If the Marine Institute does not see it necessary to have roundtable consultations then there is an immediate onus on BIM to sit down with the industry to draw up a programme for the applied research and development needed by the commercial fishing industry. Fishermen are very concerned that there is serious imbalance in the funding for fisheries by the Marine Institute in their annual research budget. The industry is now on its knees and unless fish stocks can be properly researched and managed there will be mass exodus from the industry. At the same time BIM and Udaras na Gaeltachta must agree a way forward for aquaculture, which is an essential industry for our coastal waters.

The salmon farming industry is at present only producing around 10,000 tonnes annually, down from 17,000 tonnes three or four years ago. Only a joint effort on the part of both BIM and Udaras will bring the tonnage up to 20,000 tonnes. Research and management of sites is needed but a solution must be found or there will be little left of the industry. The Central Fisheries Board should also have input, as they have much to offer with their involvement with wild salmon.

We have a thriving shellfish industry in mussels and oysters. But there is a shortage of mussel seed. Can it be solve? Management of the seed areas, with research, is essential. New species can be farmed but we seem to be in the doldrums for years. There has been little success with sea urchins, abalone and seaweeds – each with possible potential. Much funding is going into these species, yet something is wrong that we cannot crack the barrier to commercially farm them. New fish species such as turbot, halibut, sole and cod are being farmed in Europe. Is there any place for such development in Ireland? If so then let us get serious and put proper investment money into applied research and development. We must look at countries like Norway and France and see how they have achieved their successes.

It is my belief that the marine research monies are being spread among too many institutions. Surely we should have one major centre of academic excellence - where major research can be carried out especially for the aquaculture industry. University College Galway (UCG) should have that role. Originally, years before the Celtic Tiger arrived, it had been decided that UCG would have responsibility for Marine research in Ireland. The reasons it did not were self-inflicted and Galway lost a wonderful opportunity to lead. That must be put right. UCG has always had an underfunded Oceanography Department. We need a strong, vibrant centre of oceanography. We know so little about such things as ocean movements and the plankton around our coasts.

This look at marine research is but one aspect of what we must do to fulfil the job potential of the vast seas around our coast and at the same time protect it environmentally. In coming issues of Sherkin Comment we will have articles on what has to be addressed in Ireland's freshwater and marine environments. We will also be giving reasons why the Marine Institute should be solely a funding agency and its research wing a standalone institute with its own Director.

Matt Murphy, Editor, Sherkin Comment, Sherkin Island, Co. Cork.

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Manx Shearwaters

By Oscar Merne

ONE of Ireland's most important breeding seabirds is the Manx Shearwater, yet it is one of the species we know least about. This is because they spend most of their time out on the ocean and come ashore to breed only on the darkest of nights. Even then, most of their colonies are on uninhabited and often inaccessible islands around our coast. Most people are completely unaware of their existence! Exceptions to this are fishermen and seafarers who are familiar with these medium-sized black and white tube-nosed seabirds which, as their name suggests, appear to shear the surface of the sea with their long, pointed, stiff wings, as they utilise the winds and air currents and eddies to glide effortlessly over the waves in search of shoals of small fish. Others familiar with Manx Shearwaters were the lighthouse keepers on islands such as the Great Skellig, Inishtearaght and the Bull Rock off the south-west coast, where large breeding colonies are found. On dark, foggy nights the beams of the lights reflect off the brilliant white underparts of the shearwaters as they fly in from the ocean to their nesting burrows. This experience is not simply visual: the returning birds emit loud crowing calls, which their mates on duty in the burrows respond to, thereby facilitating location of the nest in the dark. The final group of humans familiar with this enigmatic species are the ornithologists who study them – either by observing their diurnal movements and migrations from prominent headlands, using powerful binoculars and telescopes, or by visiting the nesting islands to census the breeding birds and ring them and their chicks.

With the Manx Shearwater spending most of its time out at sea, many people are unaware of its existence.

Most of the breeding colonies of Manx Shearwaters in Ireland have been know for a hundred years or more, as a result of the efforts of the early intrepid ornithologists of the 19th and early 20th centuries, aided by reports from lighthouse keepers on islands where the shearwaters were present. The main colonies are on the West Cork and Kerry Islands, with outlying ones on the Copeland Islands (Co. Down) and Great Saltee (Co. Wexford).

A major discovery of the recently completed Seabird 2000 survey and census of breeding seabirds in Britain and Ireland (see last *Sherkin Comment*) was a previously unrecorded colony of over 3,000 pairs of Manx Shearwaters on Cruagh Island, off the Connemara coast of Co. Galway. There are records of a number of small colonies on the coasts and islands of Cos. Dublin, Wicklow, Galway, Mayo and Donegal, but it is now thought some of these may not have been breeding colonies, but simply observations of non-breeding birds calling at night at likely-looking sites in search of an occupied colony. A few such sites may have been occupied in the past but mammalian predators such as feral cats and brown rats may have exterminated them. A couple of sites near Greater Dublin may no longer be used because "light pollution" may now deter the birds. As mentioned earlier, Manx Shearwaters come ashore only on the darkest of nights as they are very vulnerable to predation by large gulls and they have a better chance of avoiding predators under cover of the dark.

Because of the nocturnal habits of the Manx Shearwaters, and the remoteness and inaccessibility of their nesting colonies, it is not surprising that we had only a rough idea of relative numbers of breeding birds, e.g. "a few pairs", "several hundred", ">1,000 occupied burrows", etc. However, by the time the Seabird 2000 project started seabird researchers had developed a new method of censusing Manx Shearwaters. This involved using taped calls of shearwaters to evoke responses from occupied burrows, and this could be done during daylight. The extent of the colony was mapped and measured, and the density of burrows per unit area calculated. The proportion of these occupied (as determined by the tape responses) was applied and the whole colony size was then calculated. This methodology was applied at the Irish colonies by researchers from BirdWatch Ireland, funded by National Parks & Wildlife (Department of the Environment, Heritage & Local Government) and the EU. The grand total of "apparently occupied sites" recorded in Ireland was 37,178 (upper and lower 95% confidence limits 27,269 and 60,804 respectively). In Britain the grand total was 295,089 (277,803-313,263). It is estimated that the world population (mostly in the north-east Atlantic) is 340,000-410,000 pairs, so the British and Irish breeding population constitutes about three-quarters of the world population.

The Manx Shearwaters are summer visitors to our waters, first appearing in March and leaving in September and October. We know from recoveries of ringed birds that they spend the winter mainly in the western South Atlantic, off the coasts of Brazil and Argentina, but birds have strayed as far as the coast of Australia. Some individuals are extremely long-lived (up to fifty years) so in their lifetime they must cover hundreds of thousands of kilometres.

Photos: © Oscar Merne

Above: The west ridge of Puffin Island, Co Kerry, with Skelligs in the background. Manx Shearwaters coming ashore at night to breed. Their main colonies are on the West Cork and Kerry Islands, with outlying ones on the Copeland Islands (Co. Down) and Great Saltee (Co. Wexford).

Oscar Merne recently retired as head of the Bird Research Section of National Parks & Wildlife Service, Department of the Environment, Heritage and Local Government.

GRIFFITH EVANS

A Little-known Pioneer

Photo: © ?????

Griffith Evans has bee called "The Father of the Veterinary Profession"

By Rosie Solbé

JUST before Christmas, 1935, a one-hundred year old man died in Bangor, North Wales. This event should have been world news but in fact it caused only local interest. So who was this man and why should he have been world famous?

The man was a vet. In fact he has been called "The Father of the Veterinary Profession". His name was Griffith Evans and he was born in 1835 in mid-Wales, the only son of a successful and highly respected farmer. He was a clever child with an avid thirst for knowledge who soon outstripped the local school and his home-tutor so was sent for lessons with a local doctor. In a farming community he became more interested in treating animals than in treating people so, travelling by stage-coach, he went to London, enrolled in the Royal Veterinary College and graduated in 1855. At first he worked as a vet on the Wales-England border but felt he learned nothing new so he sat the entrance exams for the army and was commissioned as an officer in 1861. He immediately left to work in Canada, leaving his fiancée behind in Wales. In Montreal he enrolled as a student in McGill University and studied medicine at the same time as being responsible for the welfare of the horses belonging to the Royal Artillery. He graduated three years later. As a child he had heard villagers at home in Wales state that the "ague" (the old name for malaria) they contracted was caused by the mosquitoes breeding in the marshes. He used this idea in his thesis in his final exams to prove that infectious diseases are caused by living organisms, "germs", and that tuberculosis is an infectious disease. This idea was considered outrageous but Evans presented good evidence - healthy people married to somebody with TB often also contracted the disease and conversely a patient he had studied, a man dying of TB, sold everything and went off to live in the backwoods of Canada returning five years later cured of the disease.

Like his parents Griffith Evans had a strong social conscience, and, anxious to use his medical skills, he applied to be allowed to work on the front line of the American Civil War. The British Embassy in Washington told him this was impossible but he persisted and was taken to meet President Lincoln who was so impressed by Evans's sincerity and genuine desire for knowledge that he issued an order that Griffith Evans be allowed to travel where he wished on condition that he undertake to give medical assistance to the wounded wherever this was needed. Thus for two years Griffith Evans acted as a medical assistant all along the Northern Army's lines - always wearing the uniform of a British Army Officer!

After eight years away he returned home to marry Katie James who had waited for him all that time and they settled in London where he worked as a vet in the Army Service Corps, but continued to study at King's College Hospital, the Royal Ophthalmic Hospital (Moorfields) and at the London Hospital.

In 1877 he and Katie went to India, leaving their three little daughters behind. In India his first task was to investigate a fatal disease affecting army horses. He became convinced that the disease (which later proved to be anthrax) was caused by a parasite in the blood. This was a year before Louis Pasteur published his "Germ Theory" (1878) suggesting that disease could be caused by living organisms. Evans also investigated another fatal disease of horses and camels - a wasting disease known as "surra". After careful examination of samples of the blood of infected animals he concluded that this too was caused by a blood parasite. He requested permission to use the infected blood to try to induce the disease in healthy animals to show that the parasite did cause disease but the authorities were totally opposed to such an idea – as a vet it was Evans's job to prevent disease not to cause it. Evans produced microscope slides of the blood of infected animals "swarming" with the micro-organism later named after him, Trypanosma evansi (a parasite related to the one we now know causes Sleeping Sickness in human beings) but the authorities were adamant that micro-organisms in the blood of a living animal could not cause disease and were only there because the animal was sick.. However, with the permission of the Governor of the Punjab, Evans carried out a series of experiments inducing surra in healthy horses and camels using the freshly drawn blood of diseased animals. He also showed that if infected blood was drawn and left to stand for 20–24 hours the micro-organisms disappeared and the blood no longer caused the disease. He sent his report to the Veterinary Journal in 1880, but it was ignored and finally destroyed. However, he sent copies of his report to both Louis Pasteur and Robert Koch both of whom, to quote Evans "thought there was something in my theory", and in Europe fifty years later his report was hailed as a masterpiece. In 1917 Evans, speaking of his work to a medical audience, asked them to remember that his report had been published " ….some time before Koch published his classical postulates."

Griffith Evans was sent back to England in 1885 because the Army authorities were convinced that the Indian sun had got to him and addled his brain! He continued his research and was given the go-ahead to see if his Trypanosomes could pass from a rat to a monkey, but at the special request of Queen Victoria his licence was revoked as the Queen had a strong dislike of experiments on animals. Evans retired from the army in 1890 and settled in Bangor, North Wales, where he became a lecturer in Veterinary Hygiene in the Department of Agriculture at the University College of North Wales, Bangor for the next twenty years.

His outstanding work was finally recognised in Britain. In 1913 he was granted a Distinguished Service Pension; in 1917 Liverpool University awarded him the Mary Kingsley Medal for "Distinguished Scientists who have Assisted the Cause of Tropical Medicine by Original Research"; the University of Wales conferred on him the degree of D.Sc in 1919 and he was made a Freeman of the Borough of the City of Bangor in 1931. However it is sad that today this very important scientist remains largely unknown despite his original work, whereas the names of Pasteur and Koch are recognised internationally.

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Market Trends Affecting the US Recycling and Papermaking Industry

By Peter Marcalus

THREE dynamics are coming together that can potentially influence the U.S. papermaking and recycling industry. The outcome of these three influences could create dramatic changes within the papermaking industry that will result in industry job losses and higher costs for recyclable material collections for U.S. municipalities.

The China Syndrome: China is coming into its own as a major consumer of energy, steel, paper and other raw materials to feed their expanding manufacturing infrastructure. This is required for their domestic economic market growth and to fill China's trend as the world's predominant exporter of consumer goods.

Specific to the export of recovered paper fibre from the U.S., in 2004 America will sell over 14 million (standard) tons of waste paper to export markets. Over half of that tonnage will be consumed by Chinese paper makers.

China's growing appetite for U.S. recovered fibre comes at the same time as America struggles to make an economic recovery from its four-year recession. During this recession and even today, all U.S. paper makers faced increases in fibre, energy prices, labour and insurance costs and reduced finished goods prices. Cost increases combined with decreasing finished goods demand, caused many U.S. paper makers across several market segments to incur slowdowns to reduce the supply of their finished goods in order to match the market's pared-down demand. Another consequence of rising costs has been the permanent closures of several independent paper factories and the layoffs of thousands of workers.

China paper makers will consume over half the tonnage of waste paper that the US will export for 2004.

Several leading research groups feel China's hunger for energy and recovered paper will bring further pressure on U.S. users of recovered fibre. In order for the U.S. to keep up with the international demand for it's recovered paper fibre, North America's export fibre surplus will need to expand to 18.5 million tons by 2010. As the U.S. paper industry further recovers from its recession, it will also require more recovered fibre.

The end result will be to put ever-increasing pressure on energy and fibre prices, which will cause many paper makers to try to utilise other papermaking fibres. Older, mid-sized independent U.S. papermakers and those producers that are heavily invested in recycling technologies could be faced with closures or they will need to make major changes in their businesses in order to survive. These changes usually come with worker layoffs and severe regional economic distress for the communities where these businesses are located.

The Big Get Bigger: When it comes to getting bigger, no business does it faster and with more jugernuaght determination than Wal-Mart. This mega-retailer is causing competing food and mass merchandiser retail outlets to close or at least merge with retailers if they are to survive. As a result of Wal-Mart's success and the growth of other retailers like club and big box stores, independent supermarkets are being bought by national food chain or they are simply going out of business.

Several major containerboards, paperboard and tissue mills have merged during the last five years. Most of these mergers within the paper industry also mean the consolidation of major paper recycling power.

What do mega retail chains and paper industry consolidations have to do with recycling? The answer is that fewer, but larger retailers will leverage down the prices for finished goods. This is a fact that Wal-Mart proves everyday at the expense of U.S. jobs being lost to lower cost finished goods production from China. Less recovered paper will also be chased by fewer, but larger U.S. paper makers-recyclers. Additionally, U.S. mills will compete for fibre with export demand. U.S. mills will be forced to pay more for waste paper fibre as China's papermaking industry continues to expand and demand more raw materials.

Faced with increased raw material costs and lower finished goods revenues, U.S. paper mills will lose business to overseas producers that can effectively compete for raw materials and then resell their goods into the U.S. because of vastly lower labour costs and government subsidised support.

Photos: © Marcal Paper Mills, Inc.

Mergers within the paper industry also mean the consolidation of major paper recycling power.

Single Stream Collections: Single stream materials collection is a method that allows collection trucks to go from house to house and pick-up one collection bin filed with all recyclables commingled together. This means glass and plastic bottles, plastic food containers, metal cans, corrugated boxes, newspapers, advertising mail and fliers as well as home office paper all go into one 50 gallon residential bin that collection trucks pick-up using mechanical lifts.

The U.S.'s waste collection industry is promoting this concept to their municipal customers as the answer to reduce collection costs and boost recycling rates. Their claims of reduced costs and increased waste paper collection rates are confirmed by a recent study sponsored by the American Forest & Paper Association (AF&PA).

However, the study also concludes that multi-million dollar automated sorting systems are required to create waste paper packs. These paper grades contain higher percentages of waste residuals such as plastic, metal and glass. This same study found that single stream collections would add over 8% more cost to paper industry customers that require waste paper as a raw material to fibre their mills.

Naturally, the waste hauling industry is pushing U.S. cities to adopt this "money saving" recycling method. The hauling industry owns the collection equipment and also is on the forefront of owning and installing the new sorting systems required to make semi-marketable paper grades from single stream collections. These haulers will control collection and the marketing of a considerable percentage of U.S. recyclables.

The down side of this concept is that paper makers will assume higher costs to dispose of residuals in the paper and they will face severe equipment wear and tear primarily from the glass and grit in the waste paper. These costs will create an added burden for an already stressed paper industry.

For American towns, they will need to re-educate their citizens to mix all recyclables into one bin. Citizens will need to forget about the decades of "paper training" in which municipal recycling coordinators promoted source separation of recyclables into different collection bins.

I foresee that once "recyclables" are all commingled; haulers will gradually rise tipping fee charges of this mixed material to a point that will be very close to the disposal rates for municipal solid waste. The net results are towns will loose the revenues they now earn for their recyclables and they will have no option but to accept higher disposal costs for their recyclables because once they educate the public to commingle recyclables, there is no turning back to once again get them to re-sort their materials.

"Faced with increased raw material costs and lower finished goods revenues, U.S. paper mills will lose business to overseas producers that can effectively compete for raw materials and then resell their goods into the U.S. because of vastly lower labour costs and government subsidised support."

Is it all gloom and doom or is it just this writer is weary from a slow recovery from a long recessionary period and the thought of impending winter weather? Only time will tell. A brighter outlook on U.S. recycling and the papermaking industry could very well result if just one of the following events happen: The U.S. experiences an economic recovery in which finished paper goods realise sustainable levels, energy costs are reduced due to higher world fuel production or if China's economic bubble bursts as a result of over expansion.

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Weather Station

TUCSON Automatic Weather Station on Sherkin Island, Co Cork.

By Frank Clabby

Introduction

IN 2000 Met Éireann embarked upon the TUCSON programme of Automatic Weather Stations (AWS's). TUCSON stands for The Unified Climatological and Synoptic Observational Network. The prototype was installed in the spring of 2002. At the time of going to print, work has begun on the 11th station.

Synoptic Observations are detailed real-time measurements of temperature, dew-point, air pressure, wind speed and direction for immediate analysis towards forecasting weather situations. Climatological observations on the other hand are measurements of temperature and rainfall, mainly, for later analysis to describe weather patterns over a longer period. For the moment Met Éireann will use TUCSON for climatological work.

Met Éireann currently has its own network of 16 synoptic stations and approximately 80 climate stations. In the synoptic network there are different stages of automation. All of the climate stations are manual where readings are taken once a day. However, in today's world of technology there are greater demands for data.

The TUCSON programme has many advantages for Met Éireann. It has been developed in-house. This gives us greater control and the ability to makes changes quickly. Sensors are readily available as opposed to custom-made.

The station measures:

- Temperature
  Air
  Grass
  Soil – 5cm,10cm,20cm
  Earth – 30cm,50cm,100cm
- Rainfall
  0.1mm & 0.2mm gauges
- Solar radiation
- Wind speed & direction
- Atmospheric Pressure
- Relative Humidity

All sensors are connected to a Campbell Scientific logger. They are sampled regularly. The data is stored in the logger and collected every hour automatically via the telephone line. The system is so designed that a minimum of processing is carried out at the site. Therefore it is raw data that is collected. This gives us greater flexibility to process the data in different ways.

Photos: © Robbie Murphy

The Solarimeter – for sunshine measurement.

A tipping bucket Rain Gauge. This is the 0.1mm gauge being levelled in its position.

The Soil PRT (thermometer) pairs with their depth gauges fitted, before being covered in.

TUCSON comes to Sherkin Island

There has been a climate station at the Marine Research station on Sherkin Island since 1972. Given its location and the amount of the south coast not covered, it is an ideal location for an AWS. Plans were drawn up in 2003 for the installation, 70 metres from the climate station. The choosing of the site and the planning application process was organised and handled by Joe Lyons from our Climatological Division. Following a protracted planning application process the project was given the go ahead.

As we awaited planning, thoughts and ideas of how this project would be carried out started towards the end of 2003. As Project Manager this was the most challenging project ever taken on. The site, being on an island and an 8-hour drive from Dublin meant that very detailed planning had to be put in place to ensure the smooth and effective execution of the project. This installation was different in that the station was being installed on private property – all installations heretofore were on state property. We do all the work ourselves except the installation of the masts. We also hire a plant contractor. The mast is normally installed in two parts, the pouring of the concrete plinth followed by the assembly and fitting of the mast a week later.

Before this project was handed over to us in the Instruments Division, Joe and I visited the site. Following that I again visited to plan an outline of the site and then list up items for the job. On this second visit I was informed that a plant contractor was on the island and advised that as he was there it would be best to start immediately. This bought the project forward by a week or two. Dermot O'Donovan

From left: **Frank Clabby, Howard Whelan & Joe Carey.**

Howard fixing cables to the mast from the anemometer sensors on top.

at Sherkin Island

The Stevenson Screen. Note the tubes for the Earth PRT's in the foreground.

was hired and advised what was required. This was new for him too.

In the case of Sherkin Island and the distant involved we decided to do the concrete work ourselves. Then the fun began. Now we had to organise the concrete locally; then organise the ro-ro ferry to take the concrete across to the island. As the lorry couldn't take the concrete right up to the site, more local organisation was required there. Add to that the nervousness of the concrete company and you get the picture. Suffice to say that, that module of the project ran off smoothly.

The anemometer sensors at the top of the mast. The crossarm is fitted due N-S with the direction vane on the northern end..

Once the concrete was in and the initial work carried out by Dermot, work began on installing the station. The pressure of the job had eased somewhat now! But there were still challenges. As the site is rocky we had great fun driving stakes for the assembly of the turf walls. And then of course there was the weather, driving rain and high winds followed by spells of fresh winds and cold dry air. But Sherkin Island is beautiful when dry and the air is clear.

In order not to loose too much time travelling Joe Carey and I stayed on Sherkin Island over the weekend of 17th and 18th of April. But our best plans came unstuck when it lashed rain all day Saturday. Howard Whelan returned to us on the following Monday bringing with him the items that we required. One was reminded of a relative coming home from abroad as Joe and I went to the Island pier to meet him. The mast arrived on Thursday and was assembled and fitted. The two men that fitted it were so overwhelmed with the scenery, that they spent more time observing than it took to fit the mast. They had time to spend as they had to wait for the ferry.

By the end of week 17 the station was effectively finished. The following week the system was tested and was commissioned on the 28th of April. Dermot returned to us with his digger to complete the turf walls of the rain gauges, tidy up the site and punch holes for the installation of posts for the fence around it.

Since then the station has been giving quality data. It has become an extremely valuable tool in sea-area forecasting for the south coast. As the record builds up, the value of the data can only increase. As the whole project develops further within Met Éireann, Sherkin Island will be very important within that development.

In conclusion, I would like to acknowledge the help given to us by the Murphy family. To Michael for the help in organisation of items at the beginning of the project; to Susan for our well-being; to Robbie for the photographic record and to Matt for his "minding" of Howard.

The personnel who worked on the project were Frank Clabby, Joe Carey and Howard Whelan.

Synoptic sites in Met Éireann: Malin Head, Belmullet, Knock Airport, Claremorris, Clones, Finner, Cork Airport, Mullingar, Birr, Kilkenny, Dublin Airport, Casement Aerodrome, Shannon Airport, Valentia, Rosslare and Roches Point.

TUCSON Sites: Mullingar, Phoenix Park, Mace Head, Teagasc sites at Johnstown Castle, Oakpark, Moorepark & Ballyhaise, Roches Point, Mount Dillon (Co Roscommon), Sherkin Island & Newport, Co Mayo (currently being installed).

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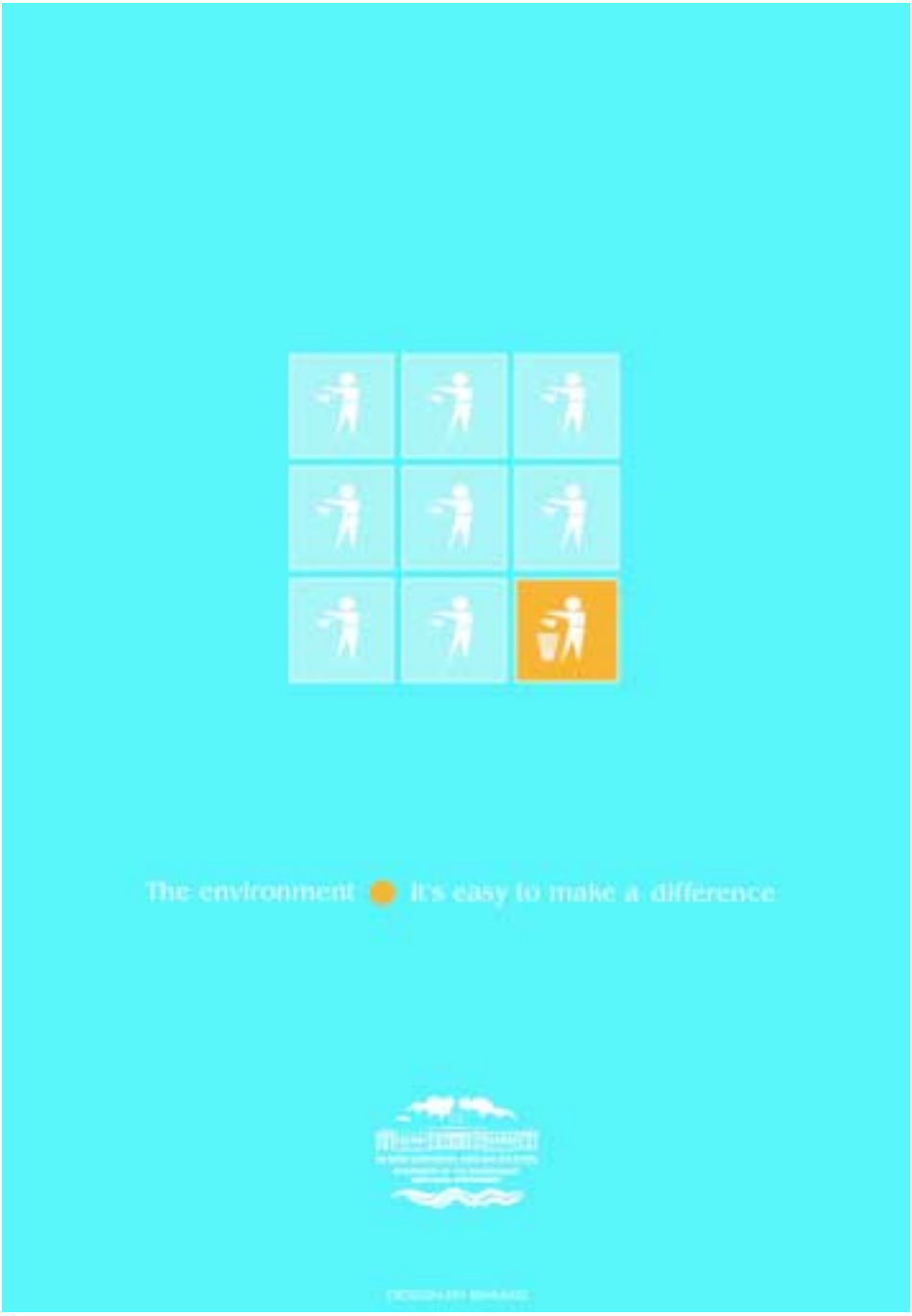
Photos: © Robbie Murphy

The rain gauge with its turf wall.

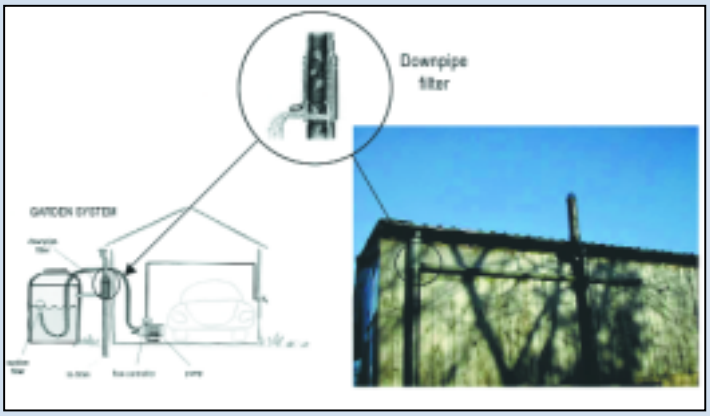


Rainwater Harvesting

SHERKIN COMMENT is pleased to report on a new project being undertaken on Rainwater Harvesting.

Recent economic growth in Ireland has significantly increased the demand for water supplies and has led to pressure on water resources. The traditional approach to meeting increased demand in the water sector has been to develop new sources / supplies to augment existing supply. This approach has economic implications with regard to infrastructure and associated environmental costs. Alternative options have been identified using efficiency and conservation measures as solutions to water capacity problems. Several European studies have shown that the link between water use and economic growth can be broken, by utilising efficiency and water conservation measures, and substituting rainwater for treated potable water, where suitable.

The pace of economic development will increase the demand on water supply infrastructure over the next 10 years. The per capita consumption of water, for domestic use by an individual, on a daily basis is estimated to comprise 60% of the total demand for water in Ireland. The most recent and most comprehensive study of water in Ireland, The National Water Study, estimated that the average per capita water consumption (PCC) for Ireland in 1997 varied between 130 l/h/d (litres per head per day) to 139 l/h/d. Projections for the year 2018 indicate a PCC of between 146 and 158 l/h/d. Figure 1 illustrates the main uses of water in a domestic situation, where toilet flushing, showering/bathing and clothes washing account for almost 80%.



Photos: © ??????

Figure 2. Rainwater harvesting system for Agricultural use

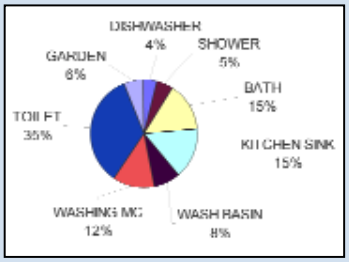


Figure 1. Typical breakdown of household water use

Methodology of Rainwater Harvesting for domestic use

Rainwater is collected from the roof and the water then passes through a down pipe to a specialised filter, which separates solids from the water. The solids pass to the surface water drainage system. The harvested rainwater water passes to a storage facility. This contains a flow equilibrium device, an overflow facility and a pump. Rainwater only supplies WCs and washing machines, a separate mains water supply provides water to wash basins. Water supply to other parts of the building remains unaffected by the alterations proposed.

In periods of low rainfall sensors in the header tank will trigger the mains header tank to supply the rainwater system. This will require a separate connection from the mains supply to the rainwater system. This mains supply will continue to supply the rainwater system until the levels in the rainwater storage tank rise and this triggers a sensor to switch off the mains supply and return to using the harvested rainfall. The proposed system is fully automatic so the pump only runs when water is called for and the system switches back to mains water when there is insufficient rainwater. Water supply to other parts of the building remains unaffected by the alterations proposed.

Agricultural Rainwater Harvesting System

Agriculture has a significant water demand for irrigation, general washings and farm use. Where the water used is subject to water charges, water costs can be a significant part of the annual running costs of farm management. Rainwater harvesting has a significant potential to provide an alternative supply at relatively low capital and running costs. Figure 2 illustrates a typical rainwater harvesting facility for agricultural use.

An average Irish farm building with roof dimensions 14.4m x 13m at a pitch of 22o and an average annual rainfall of 900mm, has a potential rainwater yield of 113,603 litres per year. This could be used for irrigation, farm washings, and could be treated to provide potable water for livestock. Rainwater harvesting in the farmyard has the significant additional benefit that it can reduce the amount of rainwater which is needlessly soiled on contact with the farmyard and work areas. Farmers who harvest rainfall will consequently have a reduced need for storage and landspreading of soiled water.

Pilot Project

A pilot project on rainwater harvesting is being progressed by the National Rural Water Monitoring Committee (NRWMC) in partnership with the National Federation of Group Water Schemes (NFGWS). The Dublin Institute of Technology (Engineering Section) has undertaken research into rainwater harvesting in recent times and is providing technical assistance on the project.

Some 245 water treatment/disinfection plants are being installed on group schemes around the country. It is important that both capital cost and, more importantly, operating/maintenance costs are minimised in order to ensure the financial sustainability of projects. Reducing water demand will mean smaller, more cost-efficient plants can be provided Farmers are worried about annual water charges following the commissioning of the new treatment plants. New advances in rainwater harvesting systems for both farmyards and private houses make rainwater collection and re-use simple and attractive.

In order to evaluate further the usefulness of the system, the NRWMC is advancing the pilot project with both an agricultural and domestic element.

(i) Farm application

Teagasc recommended a suitable farm location at Grange in Co. Meath. Filtered rainwater collected from farm buildings will be collected and stored in PVC tanks, fitted with a small submersible pump, and delivered to outside taps and buildings for a range of farmyard uses. Water quality will be monitored over the 12-month life span of the project.

(ii) Domestic application

Carlow County Council are advancing a large bundled DBO project for over 40 rural water supply schemes in the South & East of the country. (DBO means a system where a local authority engages a contractor to Design Build and Operate a facility. This is in contrast to past practice where contractors are engaged to design and / or to build a facility for a local authority and the authority then operates the plant. In the case of DBO the role of the local authority is simply to pay the contractor for designing, building and operating the facility.)

All participating schemes are asked to put water demand management and water conservation measures in place in order to ensure the financial sustainability of the project. The council is assisting by providing a suitable site for testing domestic rainwater collection and re-use systems. Underground PVC tanks, with a special filter attached to the downpipe, will be provided at about 6 houses in a small estate outside Carlow town. Water will be delivered via a small submersible pump to a second header tank in the attic. This attic tank will feed directly to toilet cisterns and outside taps. This “second” header tank will be connected to the standard attic tank through a non return valve which will automatically open in the event of the rainwater tank running dry during dry spells etc.

It is hoped that at the end of the 12-month period that these projects will be economically successful and will become the norm, especially in many housing estates. It is also hoped that farmers will see the advantages of harvesting rainwater.

Matt Murphy, Editor, Sherkin Comment, Sherkin Island, Co. Cork.

Dead Zones

By Michael Ludwig

Photo: © Michael Ludwig

A "Dead Zone", where oxygen depletion of the water has occurred.

I DON'T know who named the seasonally occurring, oxygen depleted, water mass off the mouth of the Mississippi River as the "Dead Zone" but the name has stuck. Yes, those levels are unacceptable, especially for species that need at least moderate levels of oxygen, but the water masses are not often the "cloud of death" that the name implies. And, fortunately, the condition does not have to be permanent. Depleted oxygen zones are naturally occurring but often, pollution aggravated seasonal events. They are most common when water circulation is limited and water temperature is elevated. Oxygen occurs in saline waters at levels ranging from 0.0 to over 14.0 milligrams per litre (mg/l). Temperature and consumption influence oxygen levels in water. As both increase oxygen levels decline and can become a problem when the impact area, duration or degree of the depletion event approaches or exceeds organism's survival limitations. While a water mass can have areas in which oxygen is absent (anoxia and a "true" dead zone), much of the zone has some oxygen but at levels below 3.0 mg/l (termed hypoxia). Many Finfish and shrimp species fall into the group needing more than 3.0 mg/l but other species (e.g shellfish and worms) are capable of surviving "hypoxic" levels. For organisms to survive a Dead Zone event the questions are "which way is out, how fast can an escape be managed or can I hold my breath until this passes?" A fish has a better chance than a snail, but the snail needs less oxygen than the fish so it can still crawl long after the fish has suffocated.

Naturally occurring oxygen depletion events were first recorded in colonial times. Lake Pontchartrain just outside New Orleans, is a textbook example. During the late summer when conditions are right, the Lake becomes so hypoxic many species seek oxygen by crawling, flopping or squirming onto the beaches. Local citizens used to celebrate these free food or "Jubilee" events. Oxygen depletion events occur, routinely, in Chesapeake Bay and western Long Island Sound. A severe event occurred in the Atlantic Ocean off New York and New Jersey in the summer of 1976. The Gulf of Mexico "Dead Zone" footprint averages about 5,000 square miles but exceeded 5,800 square miles in the summer of 2004.

Today, we know that hypoxia and anoxia conditions are natural but can be aggravated by human activity. They are caused by too much fertilizer, especially nitrogen, being present in the water. Too much nitrogen (eutrophication) allows too much phytoplankton growth. Some of the plants sink below the depth where photosynthesis can occur and the plants start using oxygen rather than releasing it. When the mass of plankton begin to die, the bacteria that decompose things increase in numbers. They further deplete oxygen. This chain of events and the size of each link are the controlling components of a hypoxic or anoxic event.

Regrettably, we are identifying more and more Dead Zones but more disturbingly, undertaking few, effective, corrective actions. Even though a simple enforcement of existing anti-pollution laws would correct the situation, we seem unable, generally, to take action. The lack of response perpetuates the proliferation and expansion of these zones. We are finding that the source of the pollution influences our ability to address the problem. Chesapeake Bay is a perfect example. Over the last three decades the US has spent more than one hundred million dollars investigating degraded water quality in the Chesapeake system. To date, the problems continue to worsen. How can that be? Simple, the sources of the nitrogen eutrophication have not been brought under control. The three leading sources of the 300 million pounds of nitrogen pollution annually entering Chesapeake Bay are agriculture, sewage treatment plants, and air pollution. For thirty years, a voluntary approach to reducing nitrogen inputs has been used. It isn't working. The same situation exists in the Mississippi River basin. But, in Long Island Sound, in less than fifteen years, the nitrogen pollution situation has been reversed. The most obvious difference in the situations is the source of the pollution. In Chesapeake Bay and the Mississippi River watershed, one source is farms. In Long Island Sound, the largest nitrogen source is government owned sewerage treatment plants. Although the path to nitrogen reduction in the Sound has been paved with tax dollars and a couple of lawsuits, Connecticut and New York control plant operation with direct oversight and intervention. That allows the States to set and meet pollution reduction standards. In Chesapeake Bay and the far larger, Mississippi watersheds the government's ability to invoke accountability is handicapped by economics and dispersed responsibility. If the problems in Chesapeake Bay start on a farm in Pennsylvania and the Gulf of Mexico is being polluted by activities in Kansas and Iowa, change will come only when it is more "expensive" to pollute than not.

Dead Zones are not wholly American. Worldwide, researchers have found 146 dead zones. Since the 1960s, the number of identified Dead Zones has doubled each decade. That rate of identification reflects both improved sampling and escalating pollution. Many zones are seasonal, but some of the low-oxygen areas persist year-round. However, without the "will" to reverse the trend, coastal waters that can be degraded seem doomed to that fate.

Michael Ludwig,
NOAA/Fisheries, Milford,
CT 06460, USA.

Public Action for Sustainability

TRADITIONAL production methods and patterns of consumption, particularly in the industrialised countries, are the major cause of the continued deterioration of the global environment. Meanwhile the poorer segments of humanity are unable to meet food, health-care, shelter and educational needs. It is essential to have sustainable production and consumption patterns to redress this imbalance.

The general principles in the "What can I do"? section can be applied to most situations as a means towards achieving sustainability. Other information leaflets in this series contain more specific choices which you can make. They are only a small representative sample of a long list of choices which could be made – it would be impossible to give a comprehensive list. However, it is most important to understand the implications of what you do, that it is possible to make changes as an individual or in partnership with others and that there is information available to assist you in making those choices.

Environmental Partnership Fund

The Department of the Environment and Local Government operates an Environmental Partnership Fund aimed at supporting up to 50% of the cost of local and national environmental awareness projects in the context of Local Agenda 21 and which involve collaboration between local authorities and community or other voluntary groups – application forms are available from that Department.

Agreement to Choose for a Better and More Sustainable Lifestyle

The first decision to make a choice is the most significant step. To help with that first step you are invited to sign the "Agreement to Choose for Sustainability" which is available separately from ENFO. You may wish to hang your agreement up in a prominent position at home or in your place of work as a constant reminder of your choice.

What can I Do?

Global changes can be effected as a result of the combined local actions and choices of individuals for a more sustainable lifestyle. There are key steps in moving towards a better and more sustainable way of life:

- Acceptance that there are potential environmental and social implications arising from human activity, whether as an individual or as a member of a group or organisation. There is a need for greater understanding of the issues involved and that people, as groups or individuals, can act positively to make a difference.
- Participation - Active participation in the process of change to sustainability across all sections of society, e.g. at local community level, including social, sport, recreational, youth and other voluntary groups, businesses and schools, in partnership with local authorities.
- Making choices which affect lifestyle in order to reduce those impacts.
- Taking account of environmental and social considerations when embarking on new ventures, projects, programmes or policies, e.g. by preparing an environmental impact statement as required under the planning and development control process.
- Choices for efficient and wise use of natural resources must be based on the hierarchy of options developed for waste management, i.e.
- Reviewing or monitoring at regular intervals what progress you are making with your choice.
- Making further adjustments or choices as circumstances develop and as required.
- Find out from the Local Agenda 21 Officer of your local authority whether there is already a Local Agenda 21 Committee or Group established in your city or county and get involved.
- Getting a group of people in your organisation or community to come together to form a local or district Local Agenda 21 Committee or Group or joining an existing group would help to explore and follow through on the issues further - the Environmental Partnership Fund may be able to assist with specific projects.

Many leaflets, relating to different aspects of the environment, are available for downloading on ENFO's website. Contact details: ENFO – The Environmental Information Service, 17 St.Andrew Street, Dublin 2, Ireland.
Tel:1890 200191
Fax:(01) 888 2946
e-mail: info@enfo.ie
www.enfo.ie
ENFO is a service of the Department of the Environment and Local Government.

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By Anthony Toole

Island of the Saints

Lindisfarne National Nature Reserve

LINDISFARNE, or Holy Island, which stands off the north-east coast of England, is regarded as the birthplace of English Christianity. In fact the origins are Irish and Celtic. In 563 AD, St Columba (Columcille) left Ireland to set up a monastic community on the Scottish island of Iona. By the time of his death in 597, his foundation had become the main Christian centre in Scotland.

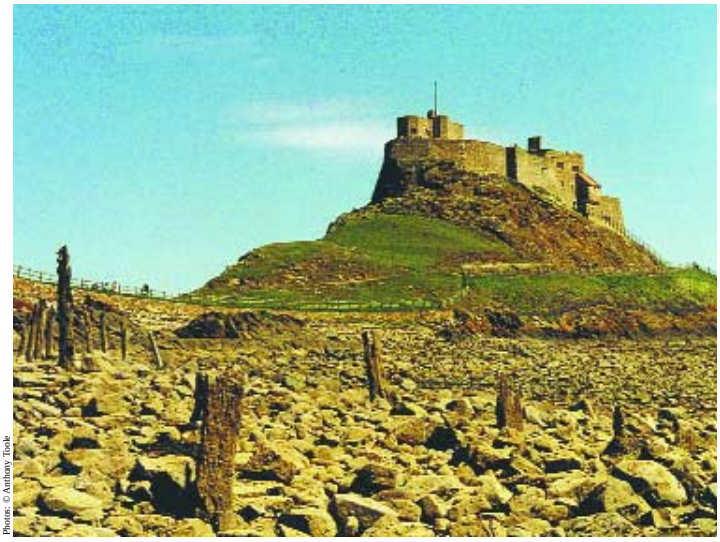
In 635, St Aidan left Iona at the request of King Oswald of Northumbria, and travelled to Lindisfarne, where he also founded a monastery. The Lindisfarne Gospels were written here by the monks, and are a masterpiece of Celtic calligraphy comparable with the Book of Kells.

Aidan's death, in 651, coincided with the vocation of a young shepherd, Cuthbert, who later became prior and finally Bishop of Lindisfarne. Cuthbert died in 687 on the nearby Farne Islands and was buried on Holy Island. Nearly two centuries later, following a series of Viking raids, the monks carried St Cuthbert's body through northern England and southern Scotland for seven years, until they reached Chester-le-Street in 883. In 995, the saint was again disinterred and his body taken to the present site of Durham Cathedral, where it found its final resting place.

The eastern end of Lindisfarne is dominated by the castle, which stands on an outcrop of quartz dolerite, part of the Great Whin Sill. This ragged line of volcanic rocks was squeezed through layers of sandstones and carboniferous limestone 280 million years ago, and is now exposed at various sites in north-east England, most notably along the course of Hadrian's Wall in Northumberland.

Elsewhere, the island consists of low sand dunes across which the cold north and east winds blow inhospitably during the months of winter. Yet the extensive mud flats and salt marshes that link Lindisfarne to the mainland at low tide harbour an abundance of invertebrates. These attract huge numbers of birds, many of which travel thousands of miles to spend winter here. One notable resident, the eider duck, is known locally as St Cuthbert's (or more colloquially, Cuddy's) duck.

Because of its importance as a wintering site, Lindisfarne has been named a Special Protection Area for birds, under a European Union directive. In addition, the island and several miles of Northumbrian coastline to the north and south have been declared a National Nature Reserve by English Nature, and are recognised as of international importance under the Ramsar Convention for the Preservation of Wetlands.



Photos: © Anthony Toole

Lindisfarne Castle stands on an outcrop of the Great Whin Sill.

The sand dunes of Lindisfarne, like dunes anywhere else, have been piled up by wind and tide, and are now held in place by marram grass. In the sheltered low ground behind the dunes, grasslands have established themselves along with a rich variety of flowers. Forget-me-nots, early purple and pink orchids and scurvy grass provide spring colour. These are followed by bird's-foot trefoil, silverweed, ragwort and viper's bugloss.

In late summer, Hebridean sheep are brought in to graze on the tough grasses. This allows flowers like Grass of Parnassus and orchids such as twayblade and marsh helleborine to thrive.

A less welcome plant, which blights the summer dunes, is the pirri-pirri bur. This New Zealand native probably arrived as seeds clinging to sheep's fleeces and now sticks to any clothing or animal fur that it contacts.

The flowers of the grasslands provide food for many insects. Burnet, cinnabar and tiger moths are plentiful, as are butterflies such as grayling, tortoiseshell, painted lady and dark green fritillary. While walking through the dunes, a visitor needs great care to avoid trampling on brown-lipped snails.

High tides comes to the causeway. Posts marking the Pilgrim's Way can be seen on the right.

Mud flats below Lindisfarne Castle.

Two small pools of freshwater are found on the island. The western pond, on a stretch of land known as The Snook, is somewhat bleak and windswept. Its shores are home to the rare black bog rush. The Lough, near the east coast, is lusher in its vegetation, which includes reeds, reedmace, yellow flag iris and bogbean. It was probably dug by the monks as a source of fresh water and fish. Now it attracts waterfowl such as mallard, coot, moorhen, shoveller and little grebe, as well as nesting black-headed gulls.

The invertebrates of the tidal marshes and mud flats are food for waders and wildfowl. In winter, the numbers of feeding birds, knot, turnstone and oystercatcher, are swelled by visiting greylags, widgeon, grey plover, redshank and bar-tailed godwit. Lindisfarne is the only regular wintering site in Britain for pale-bellied Brent geese from the Svalbard archipelago. Winter also brings whooper swans and divers such as tufted duck and pochard to the more sheltered environment of The Lough, while peregrines, sparrowhawks and short-eared owls hunt across the centre of the island.

All year round, common and grey seals can be seen bobbing in the waves or basking on the pebbles of the north-east shore.

The rocks of the Whin Sill, which provide a platform for the castle, themselves stand on a layer of limestone, which extends northward over the rest of Lindisfarne. This limestone was once quarried to make lime for curing the acidity of the fields of Northumberland. The quarried faces are still exposed near the northern coast. Fossil crinoids found here, or broken off and scattered around the shore, are often referred to as St Cuthbert's rosary beads. Delicate ferns like wall rue and maidenhair spleenwort grow out of apparently barren cracks in the limestone.

The seas around Lindisfarne are very shallow, and at low tide, the mud flats extend to the mainland. A causeway allows the passage of cars, while to the south of this, a line of tall wooden posts across the sands marks the Pilgrim's Way, which can be followed by walkers who do not mind getting their feet wet. The daily tide tables are posted at both ends of the causeway, though motorists are often stranded and have to sit out the hours of high tide in the midway shelter box.

The Northumbrian coast is only a mile away, yet when the tide comes in and Lindisfarne once more becomes Holy Island, the feeling of isolation grows strong. Amid the peace and beauty, it is then possible to sense something of what brought the early monks to this wild outpost of Celtic Christianity.

M.A. Toole, 65, Cheswick Drive, Gosforth, Newcastle upon Tyne, NE3 5DW, U.K.

Crinoid fossils (St. Cuthbert's beads) in limestone.

Grass of Parnassus.

Viper's bugloss.

The Lough, which was probably dug by the monks as a source of fresh water and fish.

Hard Rock in West Cork

Photos: © Daphne Pochin Mould

Folding of the rock formations on Garrylucas Strand, Co. Cork.

By Daphne Pochin Mould

PEBBLE pups, rock hounds, geologists, we are the people who pick up the story of planet Earth where archaeologists and historians leave off. Dog-like, nose to the ground we track the world's story back and back, millions on millions of years to the new born planet about which the astronomers then take over. "Rock solid" may be a common phrase but rocks are more mobile than you might think. These days we are familiar with the idea of continental drift, of the land masses moving, of Africa once joined to South America, of communities of animals and plants once one, now separated by the ocean.

Geology is able to trace changing patterns of land and sea, of mountain ranges heaved up, and then worn down again, of ocean and ancient shore, of deserts and forests and ice sheets. Geology can find fossil remains that tell of the coming of varied life to the sea and then its migration onto the land, the long, exciting evolution of everything that grows or swims or flies or walks or burrows. Geology is concerned with the finding of minerals, of coal and oil, natural gas and exploiting them. The world is in constant change, rocks slowly worn away and their debris carried away by water or wind or ice, to accumulate and build new rocks, elsewhere. Rock formations that sink deep into the earth and are thrown into a series of folds like a rumpled cloth, broken by fault lines, even re-crystallised deep down in the earth's hot heart.

Most of these things happen very, very slowly. But now and again they move fast. A fault line gives a sudden jolt, and there is an earthquake and collapse of buildings, loss of life. Volcanoes erupt, lava flows, earth in action is exciting to watch. There are times when you can see the world being made or changed.

The new geological map of West Cork, published last autumn by University College Cork (UCC), is therefore very welcome. It is the work of Dr. Ivor MacCarthy of the Department of Geology, the result of some 30 years tapping away at the rocks of the south of the country. (We are promised another map covering the geology to the east of this one.) It is a very big map, measuring some 5ft x 3ft, so you need a very big table, or clear floor or wall space for it. The scale is 1:75,000. Beautifully printed in vivid colours, it is a great credit to its "in house" production and printing by UCC. It is something for display rather than use in wind and rain in the field. To carry it about, you would need to cut it up and laminate. There are diagrams and sections at one side of the sheet which give an idea of structures revealed by the map.

But is should be displayed: in hotels, guesthouses, schools and colleges, libraries of West Cork: where it could not fail to attract attention. Sadly, the explanatory text that comes with the map, would mean nothing to the ordinary person, and even for the geologically literate, knowledge of the whole south west and its structures is needed. Science does not have to be like this but as George Bernard Shaw wrote so long ago: "All professions are conspiracies against the laity". True, they all have their secret languages: you do need technical terms for things and events but they need not be imbedded in polysyllabic waffle. So fewer and fewer young people are choosing science, and there are high failure rates in mathematics, that most limpid form of logic, devoid of all the "ifs" and "buts" and "what ifs?" speculations and theories of history or literature. Today efforts are being made to get scientists to write in clear English and winner of a competition so to do, is Laoise Moore, whose "Human history and the Y factor" was published in the "Irish Times" of November 25, 2004, and explains, in easy to read language, how the male Y chromosome is vital in the study of human evolution, going back and back far into antiquity.

A detailed study of rock shows that even very thin layers build up the story of the past.

So far as West Cork is concerned, the story starts some four hundred million years ago in the Devonian (Old Red Sandstone) period and ends nearly some two hundred and ninety million years ago.

What is now Ireland was then part of a large land mass, mountains to the north of West Cork, and it was dry and bare and hot and now and again, it rained heavily and sand and gravel were washed down and temporary lakes formed. There were ripple prints, just as you see them on beaches today, and if the sun baked them hard, the next wash of sand preserved them, so you can see them today in many places in West Cork – for instance in the river gorge under Carriganas Castle, Kealkil.

There are even suncracks in the sandstones on top of Hungry Hill, all from so many years ago. Later, things would change, the sea beginning to flow over the area, much of it shallow but deepening as time went on. At the end of the Carboniferous, the whole sequence would be caught up in massive earth movements, in folding and faulting of the rocks.

Those of us lucky enough to have had a classical education will be able to translate some of the more weird terms used, in for instance, the present writing. "Biostratigraphical information", a horrible linking of a Greek word with a Latin, means there were no fossils to help study of the sequence of rocks. An equally barbarous Greek/Latin mix is "Chronostratigraphy" which really only means "Time scale/sequence". Nor does a "marine transgression" mean that the sea sinned, only that it encroached on the land. And when the citizens of Cork saw Patrick Street under water recently, they did not call it a "fluvial influx". They called it a flood. And orogens and orogeny, are mountain building movements.

If this map is to have the use and the success it deserves, the present explanatory account, with its huge bibliography would benefit from being reduced to a brief, 1500 to 2000 words, history written in plain English and the bibliography cut to some six titles of useful and available works that county libraries have or can borrow.

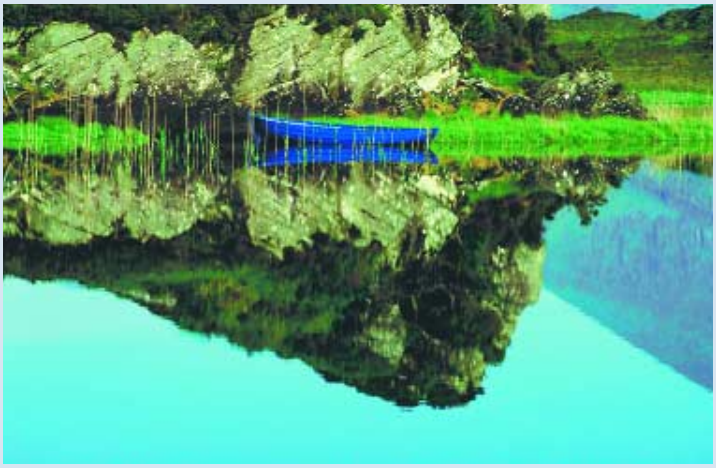
"Geology of the Devonian-Carboniferous South Munster Basin, Ireland". UCC. 2004 Available from Geology Department, UCC, Cork. €30.00 post free. Email i.maccarthy@ucc.ie

Modern ripple prints on the beach. You can see just such prints, many millions of years old, in the rocks of Cork.

The Water Framework Directive
IRELAND ON SCHEDULE

By Matt Murphy

I AM sometimes accused of being unduly critical of public authorities for dragging their heels when it comes to environmental protection. Ireland does not always win top prize for prompt implementation of EU legislation on the environment. I am drawing some encouragement therefore from the recent publication by local authorities – on time – of the very comprehensive and informative Characterisation and Analysis Reports in relation to our newly-created River Basin Districts (RBDs). Their publication means that Ireland has met all the deadlines set by the Water Framework Directive for 2003 and 2004. A summary of the characterisation reports was published on the website http://www.wfdireland.ie on 22 December 2004. I recommend taking a look. The reports are a new and valuable source of information for any person who has an interest in the protection of our aquatic ecosystems.



The Water Framework Directive will be the driving force for action by Member States to protect and improve water quality in the European Community for the foreseeable future.

WFD

The Water Framework Directive was adopted in 2000 and is a major feature of EU legislation on the environment. It will be the driving force for action by Member States to protect and improve water quality in the European Community for the foreseeable future. It has an initial timeframe of 15 years. The central environmental objectives of the Directive are to ensure (a) that there is no deterioration in the status of any waters from now on, and (b) that all waters are brought up to at least "good status" by 2015 (although the criteria / standards for "good status" have not yet been defined in detail). In the case of protected areas, any higher status appropriate to that area must be achieved. The Directive specifies that water management must be undertaken on the basis of river basin districts and that all the relevant public authorities must co-ordinate their efforts. This sounds like simple common sense but it has not always been the case in practice given that, for example, the Shannon river basin includes the areas of some 18 local authorities, not to mention the involvement of numerous other public bodies such as regional fisheries boards, Government Departments, EPA, the Marine Institute, Geological Survey of Ireland. OPW, etc. In particular the Directive requires that all the public authorities must co-operate to produce by 2009 one single River Basin Management Plan for each RBD. The plan must set out in detail the environmental objectives set for the RBD (e.g. to achieve "good status") and the full programme of measures which will be pursued by all the authorities to achieve those objectives by 2015. The plan must be reviewed and updated in 2015 and every six years afterwards. The recently-published Characterisation and Analysis Reports are an intermediate step in the process of establishing this 6-year cycle of river basin management planning.

Progress to date

Several important steps have already been taken towards implementing the WFD and establishing this planning and management process. The Directive was transposed into national law in 2003 by the European Communities (Water Policy) Regulations, 2003 (SI No. 722 of 2003). The "competent authorities" have been identified and assigned their specific statutory functions. The authorities are mainly the local authorities in each RBD with co-ordination at national level by the EPA and the Department of the Environment, Heritage and Local Government (DEHLG). The EPA has several important duties such as establishing ecological classification systems, monitoring programmes, reporting progress to the EU Commission etc. Co-ordination between the authorities North and South on the WFD seems to be good. The whole island of Ireland has been divided into eight RBDs, four of which are wholly in the South, one wholly in the North and three of which are cross-border RBDs. A major North South project is underway for delivery of the tasks required by the WFD in relation to the shared, cross-border river basins and adjacent areas. This North South SHARE Project is funded by the EU fund INTERREG IIIA and led by Donegal County Council. Five similar projects are underway to cover the other RBDs. These local authority projects carry the credit for delivery of the characterisation reports on time in December 2004. The projects are co-ordinated at national level by the EPA and the Department of the Environment.

Characterisation Reports

The Characterisation and Analysis Reports give a comprehensive description of each RBD and set out the baseline data for moving forward with implementation of the Directive. They identify all water bodies of different ecological types e.g. different types of lakes, stretches of river. A small sample of the scale of information is that the identified range of individual water bodies includes 383 groundwater, 4,465 river, 217 lake (greater than 50 hectares) 197 transitional (estuarine) and 107 coastal water bodies. The reports provide an analysis of the characteristics of river basin districts, undertakes a review of the impact of human activity on the status of waters and provides an economic analysis of water use in accordance with the requirements of Article 5 of the WFD. The economic analysis is a new and interesting look at water resources from a different perspective i.e. their economic value for activities such as recreation, tourism, industry, agriculture, drinking water etc and the related costs.

Waters "at risk"

An interesting and welcome feature of the characterisation reports is the fact that they identify the waters which, on the basis of present conditions, are unlikely to meet all the new criteria / standards which are being set for "good status" unless we take appropriate action between now and 2015. The reports identify certain waters which are known definitely to fall short of one or more of the new criteria ("at risk") and others which are "probably at risk" i.e. more information is required to make a confident assessment. The "at risk" and (in brackets) "probably at risk" waters include, by number, 2% (55%) of groundwater bodies, 29% (35%) of river water bodies, 24% (38%) of lake water bodies, 21% (18%) of transitional water bodies and 17% (7%) of coastal water bodies. These water bodies will be the focus of additional monitoring and investigations to clarify their risk status. Comparisons with the general position across the EU are not yet available because, from a quick scan of the Internet, similar reports do not yet seem to be available from most other EU Member States.

Next steps

The next phase of work, in the 2004–2006 period, in the river basin planning cycle will focus, therefore, on the further characterisation of these "at risk" water bodies to improve the information available and to increase the confidence in the risk assessments. Subsequently, in the 2006–2009 phase, the real challenge will come when Member States have to establish their detailed environmental objectives and the specific programmes of measures which will be put in place to achieve them. Will we rise to this challenge? Only time will tell. The present situation is therefore a case of lots done – lots more to do. But congratulations on the progress to date.

Matt Murphy, Sherkin Island Marine Station, Sherkin Island, Co Cork, Ireland.

A Spotlight on World Environmental Matters

by Alex Kirby

Call for ban on fishing in 30% of UK waters

The UK's Royal Commission on Environmental Pollution has called for commercial fishing to be banned in 30% of UK waters. Nobody could dismiss the RCEP as a fringe group or accuse it of not doing its homework. It wants a reversal of the "presumption in favour of fishing" it says dictates policy now, and which says that reserves to protect the North and Irish Seas would cost £9–15m annually, compared with about £35m a year for the national parks of England and Wales. The Commission's chairman, Sir Tom Blundell, says failure to act will mean many fish populations "will just collapse".

Extinction of Bird Species

Since 1500, 1.3% of bird species are believed to have slid over the edge to oblivion. But researchers at Stanford University in California say they expect 10% of those that remain will have become extinct by the end of this century – on a conservative estimate. There are clear risks to humans if birds vanish: in 1997, 30,000 of the world's 35,000–50,000 rabies deaths occurred in India, where vultures are in calamitous decline. The Stanford team says we should expect declines in other services birds provide, like pollination and seed dispersal. By 2100, they say, as many as 14% of species could have vanished, with 25% "functionally extinct" – critically endangered or extinct in the wild.

Call to plant trees at Easter

In the last half-century Kenya has lost about 90% of its forests. The first African woman to be awarded the Nobel Peace Prize is Kenya's deputy environment minister, Professor Wangari Maathai, founder of the Green Belt Movement,

which has planted 20–30 million trees in Africa to counter forest loss and slow the spread of the deserts. In her acceptance speech Professor Maathai said the world was faced with a challenge "that calls for a shift in our thinking, so that humanity stops threatening its life-support system". She called for a worldwide campaign to plant trees at Easter, as a symbol of renewal and to protect the planet.

Grim news for Pygmy Chimpanzee

There's grim news too for the pygmy chimpanzee, or bonobo, thought to be our closest relative. Researchers think it may have been hunted so much that its survival is at risk. The bonobo is found only in the heart of Africa's Congo Basin and is much less widespread than the chimpanzee. Estimates of its abundance had suggested there could be 50,000 of the apes. But WWF, the global environment campaign, says preliminary data from a survey in the Democratic Republic of Congo "shows evidence of very few bonobos living there. No bonobos were encountered, and sightings of nests and dung were only made in a quarter of the area surveyed, at lower densities than previously measured. In contrast, there was abundant evidence of human encroachment into the park and of poaching."

China increases coal imports to boast economy

If you think coal is the fuel of the past, think again. China, the world's largest coal producer, is cutting exports and increasing the amount it imports in order to keep its economy booming. International prices have risen by 50% in 2004 as a result. China relies on coal for up to 70% of its energy. The news will not cheer negotiators working to ensure the Kyoto Protocol, the global climate change treaty, requires developing countries to cut their emissions of greenhouse gases in its next phase. The human cost is appalling: 15 miners died every day in the first nine months of 2004, according to official accident figures.

EU propose minimum fines for vessels polluting European waters

European Union member states are supporting stronger measures against vessels which pollute European waters, in an attempt to prevent a repeat of the 2002 break-up of the tanker Prestige off the coast of Spain. Their proposal, which still awaits formal approval, would approve minimum fines in less serious pollution cases of between 150,000 and 300,000 euros. Worse cases would attract fines ranging from 750,000 euros to double that. Member states would be able to set higher levels if they wanted. But Malta, Greece and Cyprus are reported to have blocked a plan to set minimum penalties for ships' masters responsible for pollution.

Coral reefs in trouble

The Australian Institute of Marine Science says 20% of the world's coral reefs have been destroyed or look unlikely to recover soon, 24% face imminent risk of collapse from human pressures, and another 26% are at risk in the longer term. Bleaching and death linked to climate change is the main threat, it says. But about 40% of Pacific and Indian Ocean reefs badly bleached in 1998 are recovering, AIMS reports. Another team of Australian scientists says warmer water will do coral more good than harm, though one expert disagrees.

Offshore wind energy

The UK has become the world's second-largest generator of energy from offshore wind, after Denmark. The 30 turbines which are now producing power at Scroby Sands, off the Norfolk coast, add up to almost a quarter of the wind capacity built in the UK in 2004. The next 12 months should see an even larger increase in wind's contribution. By December 2005 the country could have 300MW of offshore wind power, about 40% of the global total.

Tackling global warming

Tackling global warming need not be prohibitively expensive, according to Professor John Schellnhuber of the University of East Anglia, UK. He says the cost of averting runaway climate change could be as little as 0.3% of global GDP. "There's no magic bullet for climate change", he says. "But if we have a portfolio strategy, we can solve it." That means reducing emissions (he lists 15 possible ways to cut carbon dioxide), and less obvious steps as well, like reducing our vulnerability to the effects of a warmer world – and building nuclear power stations.

Orchards qualify for EU subsidies

There's good news for British orchards. They are a traditional part of the landscape, and provide a home to many species, including bats, declining tree sparrows and spotted flycatchers, and the rare noble chafer beetle. Some British farmers, thinking their orchards might not qualify for subsidies under the EU's revised Common Agricultural Policy, destroyed their trees so they would still get paid. But English Nature, the government's adviser, says they will qualify after all, and may also get environmental stewardship payments.

Alex Kirby is a former BBC environment correspondent, now writing and broadcasting on environment and development.

Cuskinny Marsh Nature Reserve

By Jim Wilson

CUSKINNY Marsh Nature Reserve is tucked away on the south side of the Great Island, in Cork Harbour, 2 km east of the town of Cobh. The reserve was established in 1990 when the landowners, the Ronan and Bird families, agreed to allow Birdwatch Ireland to promote the area as a nature reserve. The reserve is probably best known to most people for the *Mooney Goes Wild Dawn Chorus* broadcasts in recent years. It occupies 26 acres and is roughly triangular in shape. Secondary roads form the western and southern boundaries and the eastern boundary adjoins farmland. The reserve land is private property with no public access. Because it is so small good views of the woodland and lake are possible from the roadway.

Treecreepers and Kingfishers in the winter, Orange tip butterflies and Lady's Smock in the spring and a fine dawn chorus in the summer are just some of the things that make Cuskinny worth a visit at any time of year. At the northern end is woodland comprised mainly of Alders and willows. The Great Island's only freshwater stream runs through the reserve. Despite a number of pollution incidences and illegal dumping in the past the stream now holds a healthy population of sticklebacks and other freshwater flora and fauna. At the southern end of the reserve are a reed bed, a brackish lake and a rough wet meadow area. In the winter Water Rails can be heard squealing in the reed bed while in the summer Sedge Warblers and Reed Buntings can be seen and heard. The lake itself is home to a resident pair of Mute Swans, which are fed by the large number of regular visitors to the reserve. Grey Herons can be seen at any time of the year, standing motionless at the lake edge or in the bay waiting for an unsuspecting fish to come within striking distance. In winter large numbers of gulls fly to the lake from all over the harbour to wash and preen and because of this the lake is visited by birdwatchers from all over the country hoping to find rare gulls that turn up with great regularly. American Ring-billed Gulls are seen almost every winter, and rarer gulls such as the American Herring Gull and Sabine's Gull have also been seen here. Sparrowhawks and Peregrine falcons are regularly seen and the sound of Ravens that nest near by is never far away. If you are lucky you might catch a glimpse of a Kingfisher, especially in autumn and winter, on the edge of the lake or in the channel next to the rough meadow. Beyond the causeway is Cuskinny Bay and magnificent views of the mouth of Cork Harbour. The bay is usually a good spot to see Oystercatchers in winter, when as many as 200 will arrive from surrounding fields to wash in the stream that enters the bay. On the bay itself in late spring the magnificent Great Crested Grebe in its breeding plumage can be seen and flocks of Whimbrel, newly arrived from Africa stop briefly on their journey to Iceland to breed. Grey and Common Seals have been seen in the bay, especially just after a storm. The Killer Whales that visited Cork Harbour a few years ago could be regularly seen from the bay. Keep an eye out they might turn up again!

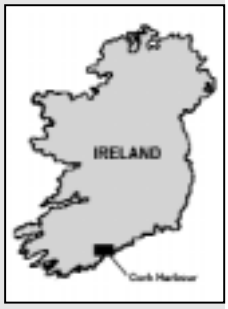
Photo: © Jim Wilson

Cuskinny Marsh Nature Reserve has grown in profile and value over the years, through the hard work of a small group of volunteers.

Through the hard work of a small group of volunteers the reserve has grown in profile and value over the years. Despite the absence of visitor facilities thousands of people visit the reserve each year. Children from the local boys' national school, Scoil Iosaf naofa, led by Willie Mac-Sweeney have been studying the small songbirds on the reserve by using nest boxes, which they made and erected on the reserve. Each spring and early summer for the last 13 years Willie and the pupils have monitored the fortunes of the birds using the boxes and have built up a valuable record of life on the reserve through observations not only of the birds but all aspects of natural history. The reserve is part of the East Cork Trail, which links 17 bird watching sites of interest in east Cork. There are three display boards at the reserve illustrating the birds to be found there. There are a series of nameplates along the western edge of the reserve showing the different tree species to be found on the reserve.

Check out the reserve website http://www.irishwildlife.net/Cuskinny.

Cuskinny Marsh Nature Reserve has a couple of rare species of tiny invertebrates and a rare lichen but what is special about the reserve is the number of habitats that can be found in such a small area. Over 150 species of birds alone have been recorded on the reserve. The sad thing about Cuskinny is that it is the only educational nature reserve in Cork Harbour. The reserve is a very popular place for people to come and relax and get away from the madness of modern living. Its value to the people of Cork cannot be measured. There appears to be no commitment by successive governments to real green space planning on the scale seen in Ireland in the 19th century. Despite the very hard work of a few dedicated individuals it is very possible that a day will come in the not too distant future when the reserve will be completely surrounded by houses and this little jewel in the heart of Cork Harbour will be lost. The government and local authorities need to begin to realise that areas such as Cuskinny Marsh are an important part of modern society and need to be bought and protected for future generations. Places like this provide a social service for the people of the Harbour area with little or no running cost. Cuskinny Marsh Nature Reserve continues to fly the flag for our natural heritage in the heart of Cork Harbour.



Cuskinny Marsh Nature Reserve is located on Great Island, Cork Harbour – 2 km from the town of Cobh.

Jim Wilson lives in Cobh and has been interested in Irish wild life for many years.

Cuskinny Marsh Nature Reserve

Shield Bugs mainly feed on plant sap, though a few are carnivorous .

Photography
Jim Wilson
(see article on previous page)

On the Nature Reserve, Grey Herons (with Mute Swan in the background) can be seen at any time of the year, standing motionless at the lake edge or in the bay waiting for an unsuspecting fish to come within striking distance.

Lichen is an unusual plant in that it is made up of tiny algae and a fungus living together as one.

The damselfly adult looks much like the dragonfly but can be distinguished by the way it holds its wings when at rest. The dragonfly holds its wings out to the sides, whereas the damselfly holds its wings together above it body.

Lady's Smock or Cuckoo flower is found in damp grassland. Here it has an Orange Tip butterfly resting on its petals.

Photos © Jim Wilson

Common seals live mainly along shorelines and in estuaries. They are commonly seen resting on sandbanks, beaches, reefs and protected tidal rocks.

Sea snails have a hard outer shell to protect their soft insides.

Catkins of the sallow tree, which appear in advance of the leaves in March and April.

Views of the EPA Director General

Matt Murphy, Editor of *Sherkin Comment,* puts a series of questions to Dr Mary Kelly, Director General, Environmental Protection Agency:

Matt Murphy (MM): What is the role of the EPA?

Mary Kelly (MK): The Environmental Protection Agency (EPA) is an independent public body established in July 1993 under the Environmental Protection Agency Act, 1992. The EPA is managed by a full-time executive Board comprising of a Director General and four Directors. The Agency is assisted by an Advisory Committee of twelve members, appointed by the Minister for the Environment, Heritage and Local Government. The EPA has a wide range of statutory duties and powers under various Acts of the Oireachtas. The main responsibilities of the EPA include the following:

- Licensing large/complex industrial and other processes with significant polluting potential;
- Monitoring environmental quality, including the establishment of databases to which the public have access
- Publishing periodic reports on the state of the environment
- Promoting environmentally sound practices
- Promoting and co-ordinating environmental research
- Licensing all significant waste disposal and recovery activities
- Implementing a system of permitting for the control of VOC emissions resulting from the storage of significant quantities of petrol at terminals
- Implementing and enforcing the GMO regulations for the contained and deliberate release of GMOs into the environment
- Preparing and implementing a national hydrometric programme

MM: Does the EPA feel it is completely independent?

MK: The Environmental Protection Agency is independent in its decision making function. Section 40 of the Environmental Protection Agency Act stipulates that it is illegal for others to attempt to initiate communication 'for the purpose of influencing improperly…consideration of any matter which falls to be considered or decided by the EPA, committee or consultative group.' Furthermore if a member of the EPA is so contacted it is their duty not to entertain the communication further and they must report this communication, in writing, to the EPA. Thus the EPA Act secures independence for the EPA by making it illegal to attempt to influence agency actions. The EPA guards this independence jealously and takes decisions based on sound science and recommendations from qualified and expert staff.

MM: What is the EPA's policy on incineration?

MK: Incineration with energy recovery has been designated as having an important role to play as one element of the Government's integrated approach to waste management. This approach is firmly grounded on the internationally accepted hierarchy that places the most emphasis on waste prevention and minimisation, followed by re-use and recovery, so as to leave the least possible residual amount for disposal by landfill. When it comes to making decisions on individual incinerators, the EPA is not involved in the physical planning process; that is the job of the planning authorities. The EPA operates a licensing system in line with all relevant national and EU legislation. The EU Waste Incineration Directive (2000/76/EC) has been transposed into Irish law. The main aim of this directive is to prevent and limit negative environmental effects of emissions into air, soil, surface and ground water, and reduce the risks to human health. Under the EPA's mandate it must ensure that all standards are complied with and that any decision to grant a license is based on the merits of a licence application covering issues such as operation and use of best available techniques. The EPA attaches conditions to licences it grants to ensure that facilities are properly managed and that risk of pollution is minimised. A licence to incinerate waste, if granted, would be conditional on appropriate abatement and monitoring of all relevant parameters so as to demonstrate and ensure the safe ongoing operation of the incinerator consistent with environmental protection. The EPA has licensed 11 industrial incinerators operating on 7 sites in Ireland since the mid nineties; these incinerators continue to operate in a satisfactory manner.

MM: To what extent are dioxins a problem?

MK: The EPA conducts national dioxin surveys, the latest of which is due to be published in January 2005. These surveys have found that Ireland has extremely low levels of dioxins, even in the areas close to operating incinerators. Furthermore, the EPA has published an inventory of levels of dioxin and furan emissions to air, land and water for 2000 and 2010, which found that even if all the municipal incinerators provided for in waste management plans were built, they would account for less than 2% of dioxins emitted to air, and that dioxin levels would remain low. The EPA is satisfied that modern incinerators, operating according to conditions set down by the EPA in licences can operate without significant risk to the environment and human health and can contribute to an integrated waste management strategy, whose main emphasis must remain prevention, reuse and recycling.

"It is widely acknowledged that industries and waste facilities, which operate under EPA licences, are much better managed than in the past."

MM: What is the EPA's policy on landfill?

MK: As with incineration, landfill will remain an integral part of an integrated waste management policy – albeit occupying the lowest position in the waste hierarchy. The role of the EPA is to decide, on the basis of licence applications, whether individual landfill sites can be licensed to operate to stringent conditions, and to enforce those conditions on the operators. Since the EPA started to licence landfills in the late nineties, the number of active landfills has reduced considerably, and the standard of operation and management has improved out of all recognition. The EPA is precluded from issuing a licence for a landfill or other waste activity unless it is satisfied that it will not cause environmental pollution. The EPA is satisfied, that modern landfills, operated according to the terms of EPA waste licences will not cause environmental pollution or risk to public health.

MM: Some would say that because you worked for industry, you should have been barred from being appointed to the Board of the EPA. What is your reaction to this?

MK: The EPA Act makes an explicit provision for the selection of the Director General as well as the four other Directors. A selection committee that consists of the Secretary General to the Government, the Secretary General of the Department of the Environment Heritage and Local Government, the Chairperson of An Taisce, the Managing Director of the Industrial Development Authority, the General Secretary of the ICTU and the Chief Executive of the Council for the Status of Women, makes a recommendation to the Government following an open competition and interview procedure, and the Government makes the appointments based on these recommendations. Current Government policy in public administration is to encourage mobility between the public and private sectors in order to facilitate cross fertilisation of ideas particularly in the area of strategic management. I have always acted professionally and with integrity throughout my career and continue to do so in my role as Director General of the EPA.

MM: Does the issuing of licences make a difference?

MK: The EPA has issued over 600 Integrated Pollution Control (IPC) licences and more than 160 waste licences to date. We have also licensed in excess of 160 GMO users and issued Volatile Organic Compounds (VOC) permits to all appropriate facilities. Prior to the existence of the EPA and the licensing of the firms engaged in these activities the regulatory environment in Ireland was considerably more lenient. Under IPC and waste licensing, firms must comply with strict conditions that place limits on the materials handled and also limits on the levels of emissions or discharges allowed. A study of 120 licensed facilities undertaken by the EPA in 2001 showed that IPC licensing had led to a significant reduction in pollution emissions. For example, total organic solvents emitted reduced by 34%, BOD by 78% and nutrient phosphorus by 93%. It is widely acknowledged that industries and waste facilities, which operate under EPA licences, are much better managed than in the past. The number of complaints received by the EPA regarding licensed facilities is decreasing and in 2004, 81% of IPPC facilities and 68% of waste facilities received no complaints. Expenditure on environmental services has increased in recent years and there are gains to industry also from this expenditure. The knowledge gained by undertaking these pollution control measures can be used elsewhere in the provision of environmental services. The employers' representative body, IBEC, itself recognises the benefits of good environmental practices through its promotion of its annual environmental awards for managing for sustainable development, eco-design, cleaner technologies, and excellence in waste management.

MM: Have the EPA ever refused licences to applicants?

MK: Yes, we have refused licences. Licence applications are refused when the operations proposed are not in line with relevant national and EU legislation and regulations. In total 9 licence applications have been refused, however, a further 41 applications were not licensed for a variety of reasons, such as the applications were withdrawn, or abandoned following meetings with EPA staff. Furthermore, in the waste area, the final licence does not always allow all of the activities applied for, and in some cases licences are issued to cover the orderly closure of sites. Licences are issued subject to operating conditions and it is through these conditions that we ensure that licensed facilities operate to the highest environmental standards. In considering a licence application the EPA considers matters relating to the safe operation of the facility, bearing in mind the impact on the environment and human health. All the licences we issue can be viewed by the public, either at our Offices or through our website www.epa.ie.

Photo: © EPA

Dr Mary Kelly

MM: Is there sufficient staff to carry out the EPA's new role under the Office of Environmental Enforcement?

MK: The Office of Environmental Enforcement was set up within the EPA in October 2003 to bring a new focus to enforcement of environmental legislation. The EPA was also given new powers of enforcement at the same time, which strengthened our hand considerably in the effort to achieve compliance with the law. The establishment of the Office of Environmental Enforcement came about following a strategic review of the EPA, which resulted in considerable restructuring within the organisation. This gave us the opportunity to dedicate a considerable number of our staff solely to the enforcement effort, enforcement of EPA licences and enforcement of public authorities in their environmental responsibilities. In this restructuring we regionalised our enforcement teams and streamlined and automated many of our internal processes allowing us to achieve much more. We are satisfied that we can enforce the licences issued to date and that through our Environmental Enforcement Network, the enforcement activities of a range of agencies from An Garda Siochana to the Fisheries Boards and Local Authorities can be coordinated to achieve much improved compliance. Enforcement of EPA licences, waste or IPC, are subject to a risk assessment approach, so that sites which have a higher risk or higher perceived risk of environmental pollution attract much more enforcement effort than those which are deemed to be of low risk.

MM: Does the EPA have enough powers regarding enforcement?

MK: The Protection of the Environment Act, 2003 considerably strengthened our enforcement powers. For example it gave us the power to direct local Authorities to carry out certain actions if the EPA deems there to be a risk of environmental pollution – a power which we have used on a number of occasions already to good effect. It also allows us to suspend or withdraw a licence under certain conditions. The OEE will make best use of the powers available to it in enforcing compliance with environmental legislation, and if we feel that these powers are not sufficient we will have no hesitation in returning to Government to seek further powers.

MM: What are the functions of the EPA's Office of Environmental Enforcement?

MK: Under the Office of Environmental Enforcement there are additional responsibilities for:

- Improving overall compliance with environmental protection legislation in Ireland
- Raising awareness about the importance of enforcement of environment protection legislation in Ireland
- Enforcing IPPC licences and Waste licences issued by the EPA
- Auditing and reporting on the performance of local authorities in the discharge of their environmental protection functions
- Taking action against local authorities that are not discharging their environment protection functions in an adequate manner
- Prosecuting, or assisting local authorities to prosecute, significant breaches of environment protection legislation, in a timely manner
- Assisting local authorities to improve their environment protection performance on a case-by-case basis, through the establishment of an enforcement network to promote the exchange of information and best practice, and by the provision of appropriate guidance.

MM: Are the courts strict enough on polluters?

MK: Most cases are prosecuted in the District Courts where the maximum penalty is €3,000 and/or six months imprisonment. The Courts have complete responsibility for deciding on the level of fine to be levied on polluters. To date, the EPA has taken 120 cases in the District Court and has been successful in the vast majority. In general we find that District Court Judges do take the environment very seriously and are prepared to convict for breaches of licence. More serious crimes against the environment are taken on indictment, and must be taken by the DPP. Penalties here can be up to 10 years imprisonment and/or €15million. Recently the number of cases taken on indictment by both Local Authorities and the EPA has increased and this is a trend I expect will continue.

MM: Are the fines imposed by the different Acts enough of a deterrent?

MK: On the face of it, €3,000 does not seem like a big deterrent to a company or organisation involved in a commercial enterprise. On the other hand, the negative publicity coupled with the fact that they will have to make good the damage caused and will often have to invest very significant sums in abatement equipment or process changes means that the fine is only the tip of the iceberg in many cases. However, from a public perception point of view, the fines are extremely low and do not seem to put much value on environmental protection. The EPA focus here is on environmental outcomes – in other words achieving what is best for the environment. Our experience has been that following prosecutions, companies and organisations generally do take the required remedial action, which often requires significant additional levels of expenditure. In the small number of cases where action is not forthcoming, it is open to the EPA to return to the Courts for further redress.

MM: The Minister / Taoiseach was asked to carry out another investigation regarding Askeaton. What does the EPA think of this?

MK: The joint investigation into animal health problems at Askeaton by four State Agencies was one of the most intensive scientific investigations ever carried out in Ireland. The EPA is satisfied that the investigations were carried out in a rigorous and scientific manner and stands over the findings of the report.

MM: The EPA monitors Irish rivers in a 3 year cycle. Is this enough?

MK: As required under legislation (EPA Act 1992) the EPA publishes a national monitoring programme for rivers and lakes, which specifies the extent and reason for monitoring and to whom responsibility is assigned. The National Rivers Monitoring Programme comprises two main sub-programmes

- the ecological monitoring programme
- the physico-chemical monitoring programme.

The bulk of the ecological programme is carried out by the EPA but the Central Fisheries Board and local authorities undertake some sampling. The programme is completed in a 3 year cycle, with some 3,200 sites monitored covering of over 13,200 km of channel length and provides information on longer term biological trends.

In the Physico-chemical programme the EPA carries out ambient river monitoring in its regional laboratories on behalf of a number of local authorities, while other local authorities undertake their own monitoring. EPA laboratories also undertake specialised sampling and analysis. The information from the chemical programme is published on a 3-year basis, though interested parties can assess the information as it becomes available.

In total over 4700 different sites on Irish rivers are included in the National Rivers Monitoring Programme, providing information for a variety of purposes. For example, managers taking decisions to upgrade treatment works, planners deciding whether to refuse or grant planning permission, scientists issuing IPPC Licences require detailed data on the potential or actual impact of their decisions.

MM: What do you feel you have personally achieved for the EPA since being appointed DG?

MK: Since joining the Environmental Protection Agency in May 2002, I have led a major process of change in the EPA which involved reviewing activities and restructuring to be able to face new challenges. I feel I have achieved a new focus on enforcement with the establishment of the Office of Environmental Enforcement, overseen the establishment of a new Emissions Trading Unit for carbon dioxide emissions, which delivered a National Allocation Plan efficiently and on time, and streamlined many processes within the EPA which will allow us to continue to deliver a first class service to all our stakeholders. One of our major areas of focus for the future is the stamping out of illegal waste activities. Of course, none of this would be possible without the full participation of the extremely dedicated and expert staff in the Environmental Protection Agency, whose commitment to the environment and its protection is second to none. I am extremely privileged to work with such a dedicated and professional group of people.

Dr. Mary Kelly, Director General, Environmental Protection Agency, Johnstown Castle Estate, Wexford, Ireland. www.epa.ie

FLAGS Green, White and Blue

By Sr. Angela Fleming

THE scenic coastal village of Rosscarbery has excelled in achieving the highest standards of care for the environment. Having flown the Blue Flag on the Warren Beach for a number of years the Celtic Ross Leisure Centre has been awarded the White Flag, while Mount Saint Michael's Secondary School's Green Flag billows happily in the South West wind.

Four secondary schools in Co. Cork have been awarded the Green Flag by An Taisce having implemented the Green Schools Programme successfully. The four schools are Clonakilty Community College, Glanmire Community College, Scoil Eoin Ballincollig and Mount Saint Michael's Rosscarbery.

Mount Saint Michael's, a co-educational school, is unique in this grouping. As a rural school, recycling facilities are limited and food waste is problematic as all students stay in school at lunch time. The categories of waste generated are multiplied due to the wide range of practical subjects taught. The positive aspect is that being situated in such scenic surroundings opportunities for developing the outdoor environment are exciting and inviting.

Three years ago a group of students recognised that greater care should be directed towards the school's environment. A review of the school as well as a questionnaire to all students showed that strategies for initially waste management would be the main target of their Action Plan. They adopted Cork County Council's logo "Reduce Reuse Recycle" as their Green Code and set out SMART targets to implement their plan (Specific, Measurable, Achievable, Relevant, Time-Related). Three years later what has been achieved?

To facilitate waste management a whole new range of bins are in use; fixed bins for outdoors and colour-coded bins for indoors. Students respond positively with the greater majority using the appropriate bins for separating waste. A rota of students collect the paper and plastic from these bins, all of which is recycled.

To deal with the 32kg+ of food waste per week a wormery was established in the base of the old greenhouse. Chemistry students ensure that worms are warm, comfortable and healthy by monitoring moisture (70%) temperature (25ºC) and pH levels (5–8). Egg shells are used to offset acidity, while shredded paper and cardboard are added to the food waste to create a suitable worm habitat. Composting activity slows down in winter and an alternative food recycling method is provided by hens who enjoyed the food so much last year that they stopped laying when summer holidays deprived them of their tasty bits. All of the school's food waste is now being recycled.

The Green Schools experience has made the school a cleaner, healthier, more pleasant place to work in and has raised awareness in the whole school community regarding what is possible to achieve in waste management.

The provision of recycling facilities by Cork County Council in conjunction with Tidy Towns Committee in 2004 makes the recycling of paper and plastic a much more manageable task for the Green Schools Committee. The school has its own recycling bin, which has reduced waste by approximately 25kg per week. The amount of paper and plastic which goes to landfill, being mindful that some forms of plastic may never disintegrate. Plastic bottles are reused to provide take-home holy water in the local church, a service which is much appreciated by the local community.

Sawdust from the material Technology Wood class, which formerly went to landfill, is now used as animal bedding while waste wood scraps are used for firewood. Waste metal scraps are also stored for recycling. The committee has now exceeded the governments target for waste reduction.

Photos: © Mount St Michael Secondary School

Mount Saint Michael, Rosscarbery, is one of only four secondary schools in Co Cork that has been awarded the Green Flag by An Taisce, having implemented the programme successfully.

At Mount Saint Micheal's a rota of students collect the paper and plastic from colour-coded bins. All this material is recycled.

The Green Schools experience has made the school a cleaner, healthier, more pleasant place to work in and has raised awareness in the whole school community regarding what is possible to achieve in waste management. The Committee was justifiably proud when the prestigious Green Flag was raised on June 1st 2004 in the presence of Mr. David O'Leary An Taisce, Máirín Ní Liatháin and other representatives of Cork County Council and the entire school community.

What Next?

Application to retain the Green Flag is made every two years. The next stage is to monitor energy and water conservation as well as caring for the outdoor environment. Wild flowers will be planted in the spring to attract bird life. Nesting boxes and bird tables will be provided in the adjoining woodland and in a setting such as Rosscarbery the opportunity for involving the wider community in long-term whole school action for the environment are endless.

The programme has been a great confidence builder for students; it has provided invaluable experience in goal setting, monitoring and evaluating as well as the encouraging experience of seeing goals and objectives achieved.

Green Schools in Ireland is operated and co-ordinated by An Taisce in partnership with local authorities throughout the country. Anyone interested in the programme can contact Green School's office, An Taisce, Tailer's Hall, Black Lane, Dublin 2. Tel 01 7077067 or email greenschools@antaisce.org

Contented hens dine on food waste from school.

The wormery in action!

Recycling of sawdust from Woodwork Room.

Notice boards made from cardboard – re-use!

Onyx, Cork County Council and Tidy Town's Competitions have made recycling a possibility in a rural area.

Sr. Angela Fleming, Mount Saint Michael's Secondary School, Rosscarbery, Co. Cork, Ireland.

Henry Chichester Hart

(1847-1908), botanist and polymath

JOHN AKEROYD looks at the life and achievements of one of his botanical heroes

IRELAND has produced remarkable naturalists, but rarely such a talented group as lived and worked in the half-century before World War I. The years 1866–1916 were momentous times, both for nationalist politics and the literary 'Celtic revival' – and also "the heyday of Irish Botany". In 1866, as Fenians hatched rebellion against the Crown, appeared *Cybele Hibernica* by Alexander More and David Moore, a first detailed account of the distribution of Irish plants. It kick-started a series of publications on Ireland's plant life: local Floras, plant lists and botanical papers, with a final magnificent flourish in Reginald Scully's *Flora of County Kerry* of the very year of the Easter Rising. Another pinnacle of an astonishingly productive phase in Irish natural history came in 1898 with an expanded second edition of *Cybele Hibernica* by Nathanial Colgan and Reginald Scully, and *Flora of the County Donegal* by Henry Chichester Hart, one of the most colourful personalities of that heyday.

Hart was born at Raheny near Dublin into a landed Donegal family, and studied natural sciences at Trinity College, Dublin, where his father was vice-provost. At university he displayed a range of intellectual interests and abilities but chose not to take up an academic post, independent means allowing him to live, like Charles Darwin and others, a free-thinking life of independent scholarship. Athlete, botanist, zoologist (with a special interest in birds), folklorist, and a biblical and Shakespearean scholar, Hart comes over as a self-sufficient, perhaps slightly aloof, imperious and crusty, but he mixed freely with the other great Irish botanists and all-round naturalists of the period – the circle of the young Robert Lloyd Praeger – and belonged to learned societies in Ireland and Britain.

Hart didn't confine himself to Ireland but joined expeditions to the Arctic (1875–6) and Palestine (1883–4), making important scientific contributions. Back in Ireland he published *The Flora of Howth* (1887), still a useful account of a remarkably wild, plant-rich area at Dublin's very edge. During the 1880s and 90s he explored much of Ireland, especially the mountains, larger river-valleys and remoter coasts. He made sure he wrote up all these travels, home and abroad, in narrative papers that still make exciting reading. Great physical strength enabled him to cover huge distances on foot but he still had time to note rare or interesting plants and record vignettes of scenery, weather and the foibles of local people and the accommodation they offered (like the constant diet of lobster along the coast of Co.Wexford!). The steepest gradient did not deter him and he would happily wade or swim streams and muddy creeks. Hence he did most of his fieldwork alone!

Hart died relatively young, at Carrablagh, his estate on Lough Swilly. Sadly his greatest work is extremely rare – and valuable. Unsold stock of *Flora of the County Donegal*, was a casualty of the Easter Rising, destroyed in one the uncontrolled fires that burned in Dublin during those difficult days of 1916. So, if you possess a copy, guard it with your life! Other memorials to Hart are a distinct population of Irish Saxifrage (*Saxifraga rosacea* subsp. *hartii*) found only on Aranmore Island off Mayo; and *Vicia sepium* subsp. *hartii*, a dwarf variant of the common hedgerow Bush Vetch, restricted to sand-dunes in NW Ireland and W Scotland. I have a special affection for this neat hummocky vetch, first reported in Hart's *Flora*. I named it myself, in a memorial volume for Professor David Webb, who introduced me to the life and work of Henry Chichester Hart in 1979 when I first came to Ireland!

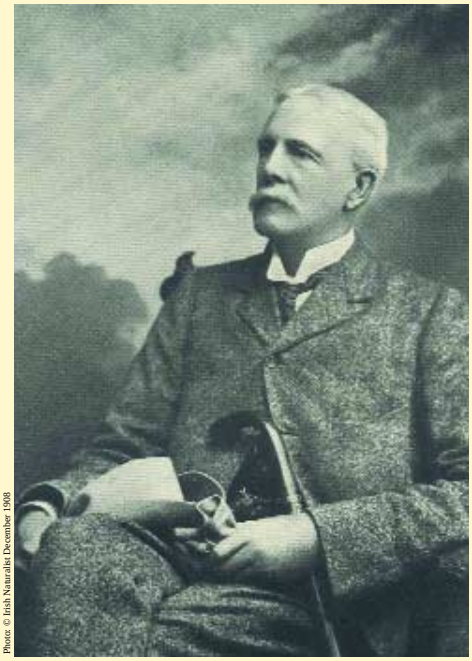


Photo: © Irish Naturalist December 1908

Henry Chichester Hart – a remarkable naturalist of the late 19th century and a colourful personality of that heyday.

Dr John Akeroyd, who has studied Irish plants (and botanists!) for 25 years, edited The Wild Plants of Sherkin, Cape Clear and adjacent islands of West Cork *(1996).*

Sherkin Island Marine Station News

Volunteers from the Station surveying the islands.

Ornithological Review of 2004

by Julian Wyllie

RECORDS for 2004 were made from 10th April until 30th November. A total of 135 species were recorded on or from Sherkin Island. Of these, 51 species bred or attempted to breed on Sherkin, and a further six species bred on islands elsewhere in the bay. Great Crested Grebe, Yellow-legged Gull and Brambling were recorded for the first time and Long-eared Owls were recorded as breeding for the first time. Mediterranean Shearwater, Marsh Harrier, Hobby, Curlew Sandpiper, Woodcock, Black-tailed Godwit, Mediterranean Gull, Sabine's Gull, Long-eared Owl and Wryneck were all recorded for the second time.

Fifty-one species of bird were found to have bred and attempted to breed on Sherkin Island in 2004.

April

April was generally cool with variable light winds until strong north-easterlies from the 27th. There was 53mm rainfall during the month. Many of the commoner migrants were already in residence when observations began with Sand Martin, Swallow, Wheatear, Willow Warbler and Chiffchaff all making their presence known. The Great Northern Diver flock off Drolain Point numbered 23 on 12th and other birds at this site included a handful of Red-throated Divers, a mixed flock of c200 Guillemots and Razorbills, Common Sandpiper and Sandwich Tern. A pair of Mistle Thrushes showed signs of breeding before they abruptly departed and Gadwall also looked promising at two sites – maybe next year? Grey Herons at East Kinish had young in the nest mid-month, and the already bustling Fulmar colony at Foildonagha featured a pair of Ravens as its centrepiece. Seawatches from Reenabulliga produced good numbers of Manx Shearwaters and three species of skua. Towards the end of the month, the list of breeding species was boosted by the arrival of Cuckoo, Sedge Warbler and Whitethroat. A Marsh Harrier, two Greenland Wheatears and the first of a good run of Whimbrels were indicative of spring passage.

May

May was calm and fairly warm throughout, with the maximum temperature exceeding 15°C on 19 days. It was also dry, with only 26mm rainfall no doubt helping breeding species, and first broods of many species started to appear. One of highlights of the year was the discovery of a brood of three Long-eared Owls, whose 'rusty-hinge' calls could be heard over the next few weeks in Kilmoon and Gneeves. Water Rail and Snipe were present in suitable habitat, and Chiffchaff, Goldcrest, Blue Tit, Great Tit and most of the breeding finches were all present in above average numbers. House Sparrows also showed signs of a slight recovery. On the debit side, there were no Rock Doves or Coal Tits breeding on Sherkin this year. Migrants were few, although a female Snow Bunting at Reenahoe on 3rd was a good spring record. A large falcon seen briefly over Horseshoe Harbour on the 5th was tentatively identified as a female Gyr Falcon, and was possibly the same bird seen on Cape Clear the previous week, but frustratingly it was not seen again and identification could not be confirmed. Consolation came in the form of a 2nd year Iceland Gull also over Horseshoe on the same day. A change to light easterly winds towards the end of the month brought about brief visits by a female Merlin and a male Blackcap along with the first Swift of the year, but little else. Sanderlings made a rare but fleeting spring visit to Silver Strand.

June

June began very dry, with less than 5mm rainfall before the 20th, although over 60mm fell between then and the month's end. Temperatures were warm, exceeding 17°C. on 23 days and winds were again light and variable. Much of the first half of June was spent surveying breeding birds on the other islands in Roaringwater Bay. Arctic Terns were present in higher numbers than in recent years and Red-breasted Mergansers were confirmed as breeding on West Calf and the Carthy's. Numbers of Fulmar and Shag remained stable although Cormorants were slightly down on last year. Gadwall, Water Rail and Raven were all present on East Calf, though there was no sign of Mute Swan there this year. Sedge Warblers extended their range to West Calf and Castle Island, and Goldcrest was a new breeding species for Heir Island. Conversely, Herring Gulls continued their steady decline, whilst Wheatears were seemingly non-existent. Back on Sherkin, a pair of Peregrines fledged young for the fourth year, with two noisy juveniles much in evidence at the month's end. Non-avian excitement was provided by a group of Fin Whales off the south coast mid month.

Photos: © Robbie Murphy

A newly hatched chick on Goat Island, Roaringwater Bay.

July

July was warm with generally light westerly winds, with temperatures exceeding 20°C. on two days. There was 45mm rainfall during the month. Return wader passage started promptly on the 1st of the month with a Common Sandpiper calling over the Marine Station at midnight and two Redshanks at the Lagoon later in the day. The first Grey Wagtail of the year was seen at Tramore on the same date. A Hobby on the 8th was notable. Seabird passage was by now well underway, with Great and Cory's Shearwaters and the first of many Sooty Shearwaters complimenting the thousands of Manxies. Storm Petrels were also seen in good numbers along with the first Bonxies of the autumn. There was a light passage of Arctic Terns mid month.

August

August was a mixture of sun and rain, with 115mm rainfall and temperatures exceeding 20°C. on eight days. Winds were generally light and westerly. Badger Island played host to a 100 plus Kittiwake roost from which birds could regularly be seen feeding at the mouth of Gascanne Sound, often in the company of Sandwich and Arctic Terns. Visible migration was apparent from 8th in the form of c200 Meadow Pipits along with lesser numbers of Skylarks and Song Thrushes heading southwest over the Marine Station. Other diurnal migrants during the month included Hirundines, and good numbers of Grey Wagtails and Redpolls. Both Kestrels and Sparrowhawks became a more or less daily sight across the island. Seabird passage was steady, with Red-throated Divers and Arctic Skuas adding variety and Grey Heron and Peregrine both being somewhat unexpected. A Mediterranean Shearwater was seen three miles south of Sherkin on 16th August. Cetaceans included Minke Whale, Killer Whale and Risso's Dolphin. Two Sunfish were also seen. Wader passage was unexceptional, with only an adult Knot (on Heir Island), two Black-tailed Godwits and above average numbers of Common Sandpipers of any note. A handful of White Wagtails and a juvenile Mediterranean Gull added spice to the last day of the month.

September

September was generally warm and wet with 110mm rainfall during the month. With the exception of light easterlies at the end of the first week, winds were generally light and westerly. Three adult Sabine's Gulls on the 1st and 2nd were most welcome and came alongside continuing good numbers of Sooty Shearwaters and Bonxies. Storm Petrel passage reached nearly 600 per hour past Reenabuliga on the 3rd, with a Mediterranean Shearwater past there on the same date. Several Common Terns were also seen early in the month. Apart from a considerable influx of Goldcrests, passerine passage was fairly low key but included Reed Warblers and an unidentified Hippolais warbler on the

7th. Waders continued to trickle through, low numbers to some extent being compensated for by a good range of species, with Curlew Sandpiper, Sanderling, Bar-tailed Godwit, Whimbrel, Greenshank and Grey Phalarope all being recorded in the course of the month. The by now regular Little Egret was joined by a second bird towards the month's end.

October

October was cool and wet, with winds moderate and variable before an easterly storm in the fourth week. There was 140mm rainfall during the month. The first Great Northern Divers of autumn flew over on the 8th. A flock of Long-tailed Tits on the 9th was unusual for the island, as were 35 Golden Plovers on the same day. Five Fieldfares on the 10th preceded the next record by almost three weeks and a flock of Redwings was in Church Valley the following day, as were two Lesser Whitethroats. A Brambling on the 14th was, surprisingly, the first record for Sherkin. The major event of the autumn was the south easterly storm of the 26th and 27th which brought about a spectacular fall of migrants. The most obvious birds were hundreds of Chiffchaffs and Robins, at least 20 Black Redstarts and many Blackcaps and continental Song Thrushes. Island rarities came in the form of a Hoopoe and a Wryneck. Other species involved included Swallow, White Wagtail, Common Redstart, Whinchat, Reed Warbler, Garden Warbler, Lesser Whitethroat and Willow Warbler. Merlins were an almost daily sight by the end of the month.

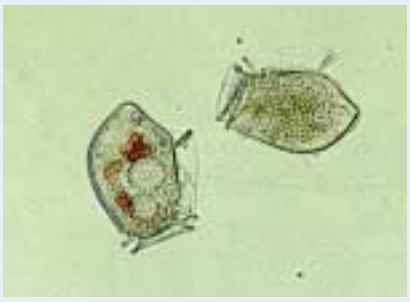
November

November was cool but generally dry, with variable light winds. 34mm rainfall fell during the month. Leftovers from the storm included several Chiffchaffs and a few Blackcaps, plus one or two Black Redstarts still at Cow Strand until 3rd. Several Water Rails and two Merlins were also present during the first week. Grey Plover and Knot made an appearance in Kinish and duck numbers built up, with Wigeon and Gadwall both exceeding previous records. The diver flock off Drolain Point held up to 15 Great Northern and over 20 Red-throated during the third week. Scarce birds for Sherkin around this time included Great Crested Grebe, Lapwing, Woodcock and Kingfisher. A ringtail Hen Harrier graced Drolain Point briefly on 28th whilst a Yellow-legged Gull in Kinish on 30th brought a satisfying end to observations for the year.

Julian Wyllie and Wendi Briggs were volunteers at Sherkin Island Marine Station in 2004.

Phytoplankton Review of 2004

By Wendi Briggs



Dinophysis acuta

THE phytoplankton team of 2004 continued the monitoring program in and around Roaringwater Bay and south of Sherkin Island that has been ongoing since 1978. Phytoplankton sampling began in mid-April and carried through until mid-October. Sampling consisted of trips that included 8 stations within Roaringwater Bay and 4 stations located south of the bay to a distance of twelve miles into the open ocean. These trips occurred approximately every 10 days (weather permitting) and sampling at one station between Sherkin Island and Heir Island occurred every 4 days. Over 50 sampling trips were completed this sampling season.

There were two major blooms during the sampling period. The first involved the diatom, *Chaetoerceros socialis* appearing in large numbers (approximately 1,161,516 cells/litre) in the Bay and South stations at the end of April and beginning of May. The second involved a bloom of the dinoflagellate *Karenia mikimotoi* (formerly *Gyrodinium aureolum*), which appeared mainly in the bay stations in July for approximately two weeks. The maximum number of *Karenia* found in one sample was on July 16th where 338,000 cells per litre were observed at a station located 8 miles south of Sherkin Island.

Noctiluca scintillans made an appearance in the waters of the Bay in August. This bioluminescent dinoflagellate is observable to the naked eye at night due to its ability to glow when agitated. If any readers saw glowing seaweed or sparks of light in the water this summer it may have been caused by this interesting phytoplankton species.

In comparing the 2004 data to that collected in 2003 there appear to be some noticeable differences. Dinoflagellate species did not begin to appear in significant numbers until the end of June, dominating the species counts until September when diatoms began to re-appear in greater numbers. The dominant species found in the summer months were *Karenia mikimotoi*, *Ceratium lineatum* (max. 9000 cells/litre), *Prorocentrum micans* (max. 3500 cells/litre), *Dinophysis acuta* (max. 2700 cells/litre), and various species of *Protoperidinium*. In 2003, dinoflagellates were found in greater numbers in the beginning of the season and remained fairly constant throughout the summer months with a slight increase in August.

The stations south of Sherkin Island experienced lower phytoplankton counts than the stations within Roaringwater Bay. The dominant species in the south stations was the diatom *Fragilaria* spp. with numbers reaching 79,200 cells/litre. Overall, the number of species was low especially in the samples taken from greater depths (25, 30 and 50m) and this trend continued throughout the sampling season.

Further study of the data collected is sure to reveal more interesting information on changes in the distribution, population and species composition of phytoplankton in Roaringwater Bay and south of Sherkin Island over the years.

Publications of Interest

How is your MPA doing?
A Guidebook of Natural and Social Indicators for Evaluating Marine Protected Area Management Effectiveness

By Robert S. Pomeroy, John E. Parks, Lani M. Watson

IUCN – The World Conservation Union
www.iucn.org

ISBN: 2-8317-0735-8

Price: €16.50stg / 2004

This guidebook offers managers and other conservation practitioners a process and methods to evaluate the effectiveness of marine protected areas. Section One includes selecting the indicators, planning and conducting the evaluation communicating results and adapting management. Section Two – the MDA management effectiveness indicators marine conservation areas and will because of necessary become the normal in European waters in coming years this is the ideal guidebook for Government managers, environmentalists and others.

The Lighthouses of Ireland
A Personal History

By Richard M. Taylor

The Collins Press
www.collinspress.ie

ISBN: 1-903464-59-5

Price: €25.00 / 2004

The author was a lighthouse technician for 44 years. He visited 86 lighthouses with wonderful hair-raising tales of getting onto and off lighthouses. The description of his first trip to the Fastnet on 24th October 1964 "Suddenly I realised I was being propelled towards the short stick they call a bosun's chair, and before I knew it, I got a might heave over the side and was unexpectedly airborne. Then came the long, slow winch over boiling seas to a platform high up on the rock. The derrick was pulled in, willing hands helped me free myself of the chair, and I was standing, for the first time, on the Fastnet Rock." The author tells of his arrival at Loop Head Lighthouse by horse and cart on a bitterly cold November night and meeting Mr. M.J. Crowley known as "Pa". His tales of this unique lighthouse man are wonderful.

How many knew that the famous Brendan Behan was a painter employed by the Irish Lights in 1950. Printed is a letter to head office asking for his dismissal. The keeper of St. John's Point stated: "He is wilfully wasting materials, his language is filthy."

Starting with the Baily in Howth the author takes us in a clockwise direction around the coast of the 32 counties. A book for anyone interested in the sea and of course lighthouses.

Alive Alive O
The Shellfish and Shellfisheries of Ireland

By Noel P. Wilkins

Tir Eolas, Newtownlynch, Kinvara, Co. Galway

ISBN: 1 873821 20 4

Price: €15.99 / 2004

A gem of a book on the Irish shellfisheries. Each chapter is laced with historical background on harvesting. The story of a periwinkle farm being started in the early 1900s by the eminent marine biologists Holt and Tattersal at Ardfry Experimental Oyster Station makes wonderful reading. By the way there are recipes in each chapter for cooking shellfish. Cockles, mussels, scallops, oysters, winkles, limpets and whelks. Of course above all this brings one up to date on the present cultivation of shellfish in Ireland. His final words in the foreword say it all "This book is intended to celebrate the work of the fishermen, the researchers, the shellfish farmers, the chefs and the agencies that are bringing this about."

A Life in the Wild

by Éamon de Buitléar

Gill and MacMillan
www.gillmacmillan.ie

ISBN: 0 7171 3615 9

Price: €24.99 / 2004

Here we have the autobiography of a man of many achievements. From childhood days by the River Dargle in Wicklow, we are taken through harder times selling bargain fishing rods and budgies in Dublin to his role as a key player in the traditional Irish music scene. Then came the seemingly effortless switch to highly respected wildlife filmmaker and broadcaster. The list of players is subtlety impressive and includes many of Ireland's finest musicians alongside the likes of David Attenborough and Killian Mullarney. A fascinating account of a life in Ireland during what is now the last century.

The eel

(5th Edition)

By F.-W. Tesch

Edited by J.E. Thorpe

Blackwell Publishing
www.blackwellpublishing.com

ISBN: 0-632-06389-0

Price: £89.50stg / 2003

This is a new translation of an extremely important book. The Eel is the standard work on the genus with chapters in the book covering body structure and functions, development states and distribution of eel species, post-larval ecology and behaviour, harvest and environmental relationships, fishing methods, eel culture, diseases, parasites and bodily damage, the world trade in eels and eel processing. Contributions are included from several world authorities including new information concerning genetic diversity in eel populations and the consequences for their management.

It is essential reading and a reference for scientists and aquaculturists, eel fishermen, angling clubs and river managers. The reference section alone is awesome with 1,300 papers listed. A fascinating book, even for the lay person, it answers so many questions that one has about this "slippery creature".

Natural and Cultural Landscapes
The Geological Foundation

Proceedings of a conference 9-11 September 2002, Dublin Castle, Ireland

Edited by Matthew Parkes

Royal Irish Academy, 19 Dawson Street, Dublin 2.

ISBN: 1-904890-00-8

Price: €15.00 / 2004

A conference with the above title was held in Ireland in 2002. Its aim was to attempt to communicate with anybody with an interest or a stake in landscape, about the role of geology in the developmnet or the management and future of the landscape that we live in. Over 70 papers were presented from speakers throughout Europe. The Irish contributions included "Protecting and Managing Our Landscapes", "Rethinking Ireland's Attitude to Landscape," "Landscape in an Agricultural Context". The conference adopted "The Dublin Declaration 2002". This is printed in full on page 328. An excellent book. Highly recommended.

The Shannon Airport Lagoon
A Unique Irish Habitat

by John N. Murphy, Austin Coney, John Rattigan & Tom Lynch

Birdwatch Ireland
www.birdwatchireland.ie

ISBN: 0-9545301-0-1

Price: €10.00 / 2003

How many of the hundreds of thousands of travellers passing each year through Shannon Airport realise they are just 500 metres away from a true wildlife haven? The lagoon was created in the 1940's as a direct result of development at the airport, and has since become a must on any birdwatching itinerary of western Ireland. During autumn, winter and spring, the site acts as a magnet for thousands of migratory birds, supporting internationally important numbers of Black-tailed Godwits. The 168 species recorded there includes an impressive total of 33 different waders and several national rarities. In summer, a wealth of plants and insects more than compensates for fewer birds. This attractively produced guide should be enough to prompt further investigation.

Wild and Wonderful

by Éanna Ní Lamhna

TownHouse Dublin
www.townhouse.ie

ISBN: 1-86059-218-X

Price: €13.99 / 2004

Well known for her appearances on TV and radio (Creature Feature and Mooney Goes Wild), this is Eanna's second book. With a good balance between witty anecdote, interesting fact and thought provoking comment, we are treated to a series of eminently readable 'episodes' from both home and abroad. With subjects ranging from somewhat dubious Icelandic delicacies, scuba diving and dragonflies through current environmental policies to the private life of slugs, there is something here for everybody. In particular though, it is with teenagers that this book should hopefully make it's real mark.

The 2030 Spike
Countdown to a Global Catastrophe

By Colin Mason

Earthscan
www.earthscan.co.uk

ISBN: 1-84407-018-2

Price: £17.95stg / 2003

Spike 2030 is an up to date book which deals with some crucial environmental issues, referred to as the "drivers" which steer the future of the human race. It describes how the future quality of human society will depend largely on how we deal with these problems. The sub-title "The countdown to global catastrophe, is an attention grabber but the book does not condemn the human race to doom. Its main message is that if acted upon now, we as the human race have the ability to steer the world away from a new dark age and into a prosperous future. Issues such as water shortages, population growth and depleted fuel supplies are described to a depth suitable for the non-specialist. Having described these problems, it goes on to suggest what action is necessary to deal with these problems appropriately. The author has cited enough reference sources to leave one with a sense of credibility regarding the actual information supplied.

The Atlas of Water

Mapping the World's Most Critical Resource

By Robin Clarke & Jannet King

Earthscan
www.earthscan.co.uk

ISBN: 1-84407-133-2

Price: £12.99stg / 2004

The planet is fast running out of freshwater. More than a billion people are without easy access to safe drinking water. The maps in this atlas show the appalling misuse of water worldwide. Would you believe a leak of one drop of water per second wastes approximately 10,000 litres per year. Dirty water causes 1.7 million deaths. Underground aquifers are dropping by an alarming rate in the US, Pakistan, India, North China. This book is for young and old and essential for school libraries so that the upcoming generations will be much more caring of the most precious gift nature has given us – water.

Survival for a Small Planet
The Sustainable Development Agenda

Edited by Tom Bigg

Earthscan
www.earthscan.co.uk

ISBN: 1-84407-077-8

Price: £22.95stg / 2004

This book provides detailed analysis on the subject of sustainable development following the World Summit on Sustainable Development (WSSD), 2002. Assembling contributions from leading experts, it includes a variety of wide ranging subjects such as security, climate change, human rights, globalisation, poverty, agriculture and tourism and how they all relate to the issue of sustainable development. A key text to the implementation of agreed policies and programmes since WSSD, and a vital resource to anyone studying or researching sustainable development.

Countryside Planning
New Approaches to Management and Conservation

Kevin Bishop & Adrian Phillips (eds)

Earthscan
www.earthscan.co.uk

ISBN: 1-85383-849-7

Price: £21.95stg / 2004

The past thirty years has seen a welcome change of attitude towards the management of our natural heritage. Countryside planning and conservation are now major political tools and come under intense scrutiny from the public. Drawing on a series of case studies, this book reviews the effectiveness of policies to date and outlines possible courses for sustainability for the future. Although dealing largely with cases from England, the chapters on Irish landscapes and forestry and wind farm development make it essential reading for all concerned, from planners and local authorities to environmentalists and academics.

Water for People, Water for Life

The United Nations World Water Development Report

UNESCO Publishing
www.unesco.org / publishing

ISBN: 92-3-103881-8

Price: €49.95 / 2003

Water is an essential element of daily life for each and every one of us. Throughout this book it is in all its facets. This report addresses how much water is available per person in countries around the world. How much we need for food security in the next 15, 25 or 30 years. What regions are on track to attain the international communities pledge to reduce by half the proportion of people without access to water supply and sanitation by 2015. How much it will cost to achieve these goals. What is the likelihood that countries will go to war over water in the near future.

Many countries have yet to put in place policies to protect the excessive exploitation of water, especially from groundwater sources. The book presents seven pilot case studies of river basins world-wide. There are numerous full colour maps, country tables.

This book could be described as an encyclopaedia of water. It is a must have reference for policy makers, authorities and politicians.

The Changing Ocean
Its effects on climate and living resources

By Bruno Voituriez

UNESCO Publishing
www.unesco.org / publishing

ISBN: 92-3-103877-X

Price: €14.80 / 2003

Addressed to the layperson in particular or anyone who has an interest in wanting to begin to understand the vastness of the ocean environment. It begins with a brief history of oceanography, with chapters on the driving forces of the ocean current, climate and oceanic variations. The chapters on ecosystem dynamics include primary production, marine meadows, coastal upwelling and the spring blooms. The example of the North Atlantic. The most interesting section is the one on climate variation and fish, which covers herring, tuna, fishmeal and other species. An excellent book for libraries.

Biosphere Reserves
Special Places for People & Nature

UNESCO
www.unesco.org / publishing

ISBN: 92-3-103813-3

Price: €16.00 / 2002

This book provides a lively and well-written summary on the biosphere reserve concept and its implementation. It brings together a wealth of up-to-date information on the subject and includes objectives of the Seville Strategy for Biosphere Reserves, a basic framework for the development of biosphere reserves, interspersed with the text. There are ten chapters, which are grouped into four different sections including an introduction on biosphere reserves, functioning of the reserves, management and prospects for the future. It will appeal to anyone with an interest in the conservation of biodiversity.

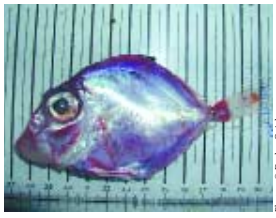
Books reviewed by: Anne Marie Mahon, Rachel Jacobsen, Matt Murphy, Julian Wyllie

DORIES

(Pisces: Zeidae) in Irish & NW European Seas

John Dory (*Zeus faber*)

Sailfin Dory (*Zenopsis conchifer*)



Red Dory (*Cyttopsis roseus*)

Photos: © Declan Quigley

By Declan T.G. Quigley

THE Zeidae is a small family of marine fishes comprising 7 genera and 13 species worldwide. However, in NW European seas, the family is represented by only 3 genera including 3 species: John Dory (*Zeus faber*), Sailfin Dory (*Zenopsis conchifer*) and Red Dory (*Cyttopsis roseus*). While the John Dory is relatively well known in Irish waters, the other two species, which have only been recorded for the first time in recent decades, appear to be rare.

John Dory (*Zeus faber*)

The John Dory, also known as St Peter's Fish, is unmistakable with its deep, flattened head and body, massive protrusible jaws, a series of long dorsal spines (9–11) extending into long filaments of soft trailing tissue, and a double series of sharp spines (bucklers) running along the belly and back. It is generally yellowish brown in colour with a conspicuous black spot (or thumb mark), surrounded by a narrow yellow border on each side of the body. An inshore species, usually occurring at depths of 5 –150m and occasionally down to 400m, on sandy ground and areas of weed-covered rocks, but sometimes found sheltering under floating objects.

Although a feeble swimmer, the John Dory is a highly efficient predator. Its strongly laterally compressed body makes it almost inconspicuous head-on and allows it to slowly stalk its unsuspecting prey prior to engulfing it from what might appear to be a safe distance with a split-second extension of its siphoning jaws. While it primarily feeds fish, particularly shoaling and demersal species, including herring, scad, sand eels, young gadoids, anchovies, and pilchard, it occasionally eats crustacea and cephalopods. Although it sometimes forms small schools, its steltful predatory behaviour probably explains why it normally lives a solitary existence.

The John Dory is a wide ranging species in the eastern Atlantic; known from as far north as Norway and southwards to Maderia, including the Mediterranean and Black Sea, and southwards via the Azores to southern Africa (where it overlaps with a closely related species – *Z. capensis*). It has also been recorded from the Indian Ocean, Australia, New Zealand, Japan and Korea. However it is not found in the Western Atlantic.

While the John Dory is known to spawn in the western part of the English Channel, (southern ?) Irish Sea and Bay of Biscay during the summer months (June to August), it is not known to spawn further northwards, although newly hatched pelagic larvae have been recorded, albeit rarely, off the west coast of Ireland. Sexual maturity is usually attained in the 4th year at a length of 40cm. Males rarely grow longer than 45cm but females may survive up to 12 years, attaining a length of 90cm and a weight of 8kg. Most of the John Dory found in northern European seas are thought to be first or second year wanderers and large dories appear to be rare outside their northern-most spawning areas. Indeed, during the year 2000, the overall size frequency range of commercially caught John Dory in Irish waters was 21–51cm but most landings were in the range 23–39cm. However, apart from the fact that reported landings have significantly increased over the last couple of decades (from c50 tonne in 1990 to 306 tonnes in 2004), little is known about the biology or the state of this relatively valuable stock in Irish waters (€913k first sale value in 2004). The John Dory has been highly regarded as an excellent food fish of epicurean notoriety since Roman times; it is well flavoured with a good flaky texture. However, its solitary habits are such that landings in Northern European waters are small, but what is captured almost always commands a premium price.

Although anglers occasionally capture John Dory, it is not regarded as a prime angling fish. The Irish Specimen Fish Committee has recorded only 48 specimens, weighing upwards of 1.8kg, since 1960. The largest specimen, weighing 3.4kg, was captured in Killala Bay, Co Mayo in August 1984. However, the vast majority (96%) of specimens weighed <3.0kg. Incidentally, the UK rod and line record, weighing 5.4kg, was captured off Newhaven, E Sussex, in 1977.

Figure 1 shows the maritime county distribution of both rod and line caught specimen (1960–2004) and commercially caught John Dory (live weight landings 1998–2004). More than 75% of commercial landings occurred along the south and southwest coasts (Cos Waterford, Cork & Kerry). However, in contrast, only 23% of rod and line caught specimens were taken in this area. Indeed, nearly 65% of the specimens were taken off the northwest coast (Co Mayo and Donegal).

Figure 2 shows the monthly frequency distribution of rod and line caught specimens. All of the specimens were taken between May and October, but the vast majority (96%) were taken between June and September. It seems unlikely that many anglers specifically target John Dory; most specimens are probably captured during the course of general angling trips.

Sailfin Dory (*Zenopsis conchifer*)

At first glance, the Sailfin Dory would appear to be very similar to the John Dory. Indeed, it is possible that the species may not be recognised by anglers or commercial fishermen in Irish waters. Apart from its distinctive silvery-grey colouration and the absence of a large spot or thumb mark on the sides, the concave profile of the head over the eye is the main distinguishing morphological feature (the profile of the head over the eye is either straight or convex in the John Dory). The Sailfin Dory does not appear to grow as big as the John Dory; the maximum reported length and weight is 80cm and 3.2kg respectively. The species also appears to inhabit deeper water (50–600m) than the John Dory.

Prior to 1966, when two juvenile specimens were recorded off the Portuguese coast, the species was unknown from NW European seas. However, since then, the species would appear to have been gradually extending its range northward via Portugal (1966), NW Spain (1970), N Spain (1974), Gulf of Gascony (1975), Bay of Biscay (1975), NW France (1976) and into Irish (1980) and SW UK (1995) waters. Indeed, a single specimen of Sailfin Dory was recently (2002) recorded from Icelandic waters. The latter specimen represents the most northerly record from the NE Atlantic to date. Elsewhere, the main distribution of the Sailfin Dory in the eastern Atlantic is from Morocco southwards to Southern Africa, and in the western Atlantic (where *Z. faber* is absent) from the Nova Scotia southwards to Virginia, and from Uruguay southwards to northern Argentina. In the western Indian Ocean, it is found from South Africa northwards to Somalia, and off the SW coast of India. It has also been recorded from Indonesia but not from the Pacific.

Since it was captured for the first time in 1980, a total of 11 specimens have been recorded. There would appear to have been a particularly strong influx of Sailfin Dory into Irish waters between 1993 and 1995 when more than 70% of the total number of specimens were recorded. Specimens have been recorded during most months of the year, apart from December – February, May and October. All of the specimens, apart from one (from the NW coast), were recorded off the SW coast, at depths ranging from 100–290m. The specimens exhibited wide variation in size: 18–58cm (Mean T.L. 39.4cm) and 75–2300g (Mean Wt 785.5g).

Red Dory (*Cyttopsis roseus*)

The Red Dory is a relatively small species (maximum 31cm T.L.) and is easily distinguished from the John Dory and Sailfin Dory by its red colouration and spinous dorsal fin lacking long filaments. The Red Dory normally inhabits deeper water (150–730m) than the latter two species. The main distribution of the Red Dory in the eastern Atlantic is from Morocco southwards to Southern Africa, and in the western Atlantic from the Nova Scotia (rarely) southwards to about northern South America. In the western Indian Ocean, it is found from South Africa northwards to Somalia and off the SW coast of India. It has also been recorded from the western Pacific: Japan, eastern Australia and New Zealand.

Prior to 1963, when the Red Dory was recorded for the first time off SW Portugal, the species was unknown from NW European seas. However, since then, the species appears to have been gradually extending its range northward via NW Spain (1968–76), into NW French, SW Irish and SW UK waters (1987–95). Although only 3 specimens have been recorded to date, it is interesting to note that two of these of specimens were captured during 1993, which coincided with the large influx of Sailfin Dory mentioned above. Two of the specimens were recorded in July and one in April. All of the specimens were recorded from the SW coast, at depths ranging from <200–440m. The specimens were relatively small in size: 11.1–19.0cm (Mean T.L. 14.7cm) and 50–150g (Mean Wt 100g).

Declan T.G. Quigley, South-West Smolts Ltd., Carrigadrohid Hatchery, Macroom, Co Cork.
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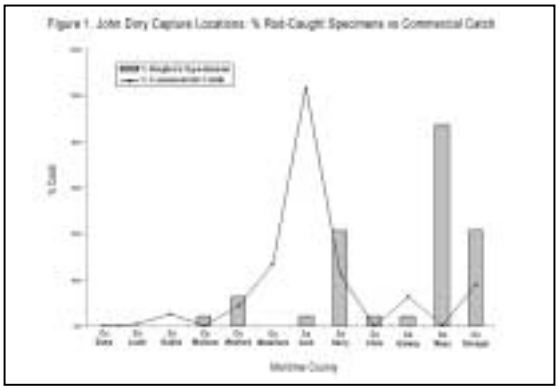


Figure 1. John Dory Capture Locations: % Rod-Caught Specimens vs Commercial Catch

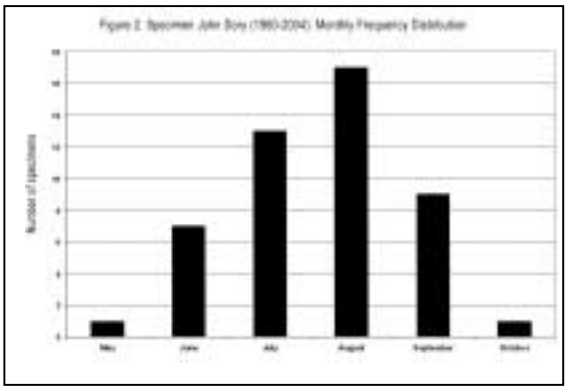
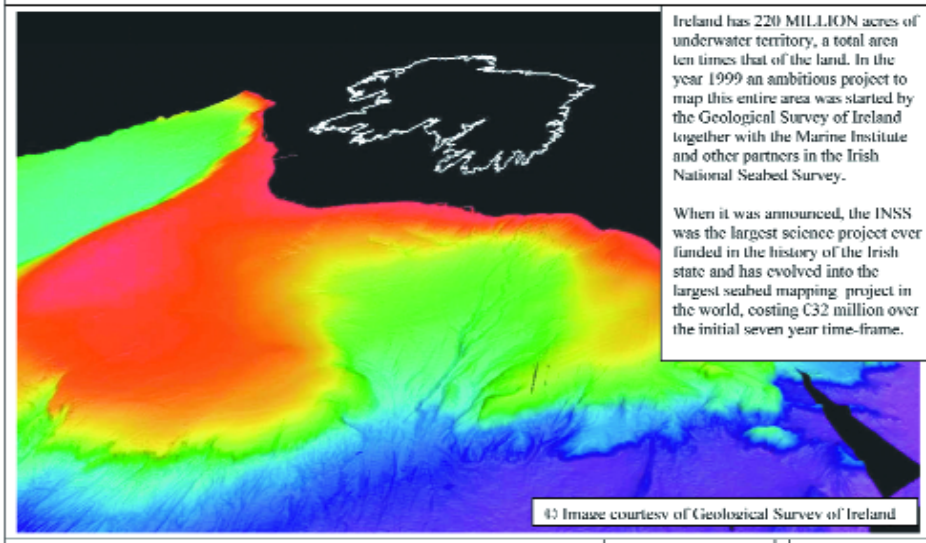


Figure 2. Specimen John Dory (1960-2004): Monthly Frequency Distribution

Junior Pages Junior Pages

220,000,000 Acres Under the Sea . . .



© Image courtesy of Geological Survey of Ireland

Ireland has 220 MILLION acres of underwater territory, a total area ten times that of the land. In the year 1999 an ambitious project to map this entire area was started by the Geological Survey of Ireland together with the Marine Institute and other partners in the Irish National Seabed Survey.

When it was announced, the INSS was the largest science project ever funded in the history of the Irish state and has evolved into the largest seabed mapping project in the world, costing €32 million over the initial seven year time-frame.

Stop Press

FREE SCHOOL CALENDERS

Free full-colour 2005 calendars, showing remarkable views from the Irish National Seabed Survey of some of Ireland's 220 million acres under the sea are available to schools from:

The Marine Institute, Galway Technology Park, Parkmore, Ballybrit, Galway.

The calender features views of the continental shelf, pictures of the wrecked liner *Lusitania* deep water corals and a look at life aboard Ireland's national research vessel *RV Celtic Explorer*.

Until recently, most of the charts around the Irish coast dated back to the time of Captain William Bligh, commander of the infamous HMS Bounty. Bligh was a master mariner and compiled many of the charts of Irish waters, including detailed maps of Dublin Bay.

CHECK IT OUT AT: WWW.MARINE.IE

Captain Cockle's Log

Welcome aboard shipmates! Together, we'll be taking a look at the world's greatest natural resource -- the sea!

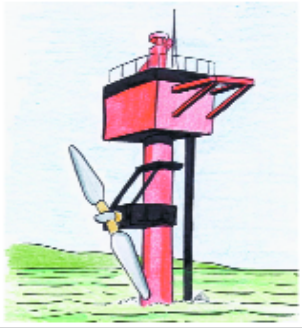
Words & pictures by John Joyce
www.cockle.com © John Joyce 2004

Power from the Sea . . .

At the international EurOcean 2004 scientific meeting in Galway last year, it was stated that Europe could generate up to 200 million megawatt hours of electricity, enough to run 20 million homes from the waves and tides in the sea.

In England the Seaflow Project harnesses the power of the tides by lowering a huge propeller into the current off Lynmouth in the Bristol Channel.

Tidal energy is non-polluting, renewable, and does not use fossil fuels.

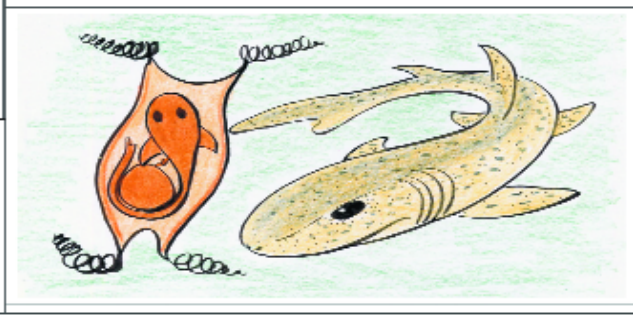


Plumbing the depths . . .

In Captain Bligh's day, depths were measured with a rope with a lead sinker at the end. Sometimes the lead weight had soft grease on the end to pick up a sample of the bottom and tell if it was rock, pebbles or sand. Nowadays depths are measured by bouncing sound waves off the bottom to give a detailed three-dimensional picture of the seabed. Sound pictures from the bottom can tell surveyors not only how deep the water is but what the bottom is made of.

What's in a Mermaid's Purse?

"Mermaid's Purses" are egg cases containing the live babies of dogfish.



Check out these cool websites:

The Irish National Seabed Survey	www.gsiseabed.ie
The Marine Institute	www.marine.ie
The EurOcean Meeting 2004	www.euroccan2004.com
Mermaids Purses	http://ourworld.compuserve.com/homepages/BMLSS/Mermaid.htm
Tidal Power:	www.marineturbines.com
Captain Bligh:	www.themagicofcornwall.com/Pages/history/bligh.htm

Learn about birds with BirdWatch Ireland

Learn how to feed and attract many different types of bird into your garden with our **'Feeding Birds'** and **'Gardening for birds'.** Download both leaflets from the BirdWatch Ireland website at: **www.birdwatchireland.ie**

Learn the calls of Redwing and Fieldfare and many other garden birds on *Garden Bird Sounds – a sound guide to 70 common garden birds.* Available on CD (€20) or cassette(€15.00) from BirdWatch Ireland: www.birdwatchireland.ie

Learn how to identify the birds in your garden with our **Free Garden Bird Charts**. Send a SAE to: *BirdWatch Ireland, Rockingham House, Newcastle, Co. Wicklow.*

BirdWatch Ireland has over 10,000 members and has branches throughout the country which organise events and outings in your area. Why not get your school to join? Write to us or visit our website for details: www.birdwatchireland.ie

BirdWatch Ireland has two educational web sites, catering for learning about birds in schools.

- Visit the Migration web site to learn about the fascination of bird migration
- Visit the Working with Birds web site to learn about watching and feeding birds

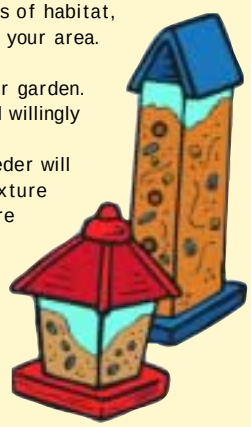
Simply go to www.birdwatchireland.ie and go to the 'learn about birds' section

BirdWatch Ireland, Rockingham House, Newcastle, Co. Wicklow.
Tel: 01-2819878 Fax: 01-2819763
Email: info@birdwatchireland.org

Website: www.birdwatchireland.ie

A Reminder to Feed the Birds!

BY feeding wild birds in our garden we can help many birds make it through the hardships of the winter months. Birds have many pressures on them from loss of habitat, so a reliable source of food can make all the difference to the birds in your area. Here are some ideas about how to help these birds.



A simple wire mesh peanut feeder will attract a host of birds to your garden. Greenfinches, Great Tits, Blue Tits, Coal Tits and House Sparrows will all willingly feed from this type of feeder.

Peanuts are not the only food you can put out. A small plastic seed feeder will enable you to supply sunflower seed. Many shops sell 'wild bird seed', a mixture of sunflower seed and various types of grain which the smaller birds are unable to eat and throw out onto the ground (where it will attract crows and pigeons). Pure 'Black Sunflower' seed is more popular than the 'striped' variety which has a tougher shell and less energy-rich kernels – and yes the birds can tell the difference! Sunflower seed is especially popular with Coal Tits.

Not all birds feed from feeders, and a selection of old apples and pears from the local market placed around the garden will attract such birds as Blackbirds and Song Thrushes, as well as Starlings. During hard weather you might also get Redwings visiting your garden to feed on the apples.

Finally don't forget to provide a fresh supply of water. This can easily be done by placing an upturned dustbin lid between two bricks and filling it with water. Place a small rock in the centre so birds won't get stuck and drown

Don't forget to take part in BirdWatch Ireland's Garden Bird Survey!

Download your form at www.birdwatchireland.ie

Bird Quiz

Where do Redwing come from?

The first five correct answers drawn will each receive a copy of *'The Usborne Spotter's Guide to Birds'* Answers on a postcard to *'Sherkin Comment'*, Sherkin Island Marine Station, Sherkin Island, Co. Cork.

Shy Winter Visitors

By Declan Murphy

THE winter months can often be a hard time for birds to stay alive. Food is often scarce, daylight is short and nights are long and cold. Birds such as the Swallow and the Cuckoo spend the winter in Africa so as to avoid these problems, however other birds from further north choose to spend the winter months in our country where the winter is relatively mild in comparison to their northern breeding grounds. Some of these winter visitors, although common, are not that well known as they do not regularly visit gardens.

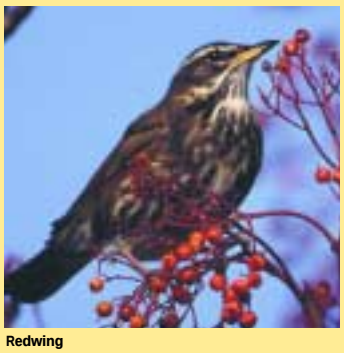
In Ireland we have three common breeding species of thrush. These are the Blackbird, Song Thrush and Mistle Thrush. During the winter an additional two species, the Redwing and the Fieldfare join the regular trio. Both species are quite shy and often overlooked as they tend to be seen at the tops of the trees or in open fields/parklands. Often the best way to find them is by their call.

Redwing

The Redwing is a common winter visitor to Ireland from Iceland and Scandinavia. Although numerous, it is often overlooked as it a small thrush and often quite shy in behaviour. Redwings start to arrive in Ireland in early October and are quite predictable with the first birds being recorded between the 10th and 14th. They are nocturnal migrants using the stars to navigate their way to our shores under the cover of darkness. If you were to step outside your house on any damp overcast night in October/November and quietly listen for about five or ten minutes, you will almost certainly hear the high pitched 'tseeeep' call they make as they keep in contact with each other as they fly overhead.

The Redwing is a very attractive thrush. With a prominent white stripe over the eye and another white stripe on the side of the cheek. The upperparts are brown while the underparts are speckled. However its most diagnostic feature, the one after which it is named, is the rich red colouring along the flanks. This colouring extends under the wings and is seen to its full effect when the bird is in flight. Unlike Blackbirds or Song Thrushes, Redwings are rarely seen alone and are usually encountered in small groups of five to ten birds. However it is not unusual to see flocks of fifty or even more, especially where the feeding is good.

Redwings are birds of open countryside. They prefer open fields and hedgerows to suburban gardens. They can often be seen on playing fields or in parks feeding in the short grass looking for worms. Berries also form an important part of their diet and when they first arrive in Ireland they can be seen in the hedgerows feeding on Hawthorn berries and Rowan berries. As a result of tree planting in many housing estates by the local council, Redwings are regularly seen feeding in Rowan trees planted alongside the road.



Redwing

The return migration to their home breeding grounds usually takes place in March when once again the night skies are filled with their 'tseeeep' calls as they make their way north.

Fieldfare

The Fieldfare is a regular winter visitor to Ireland from northern and central Europe and Scandinavia. It is a lot less common than Redwing and is usually encountered in smaller numbers. Fieldfares arrive in Ireland later than Redwings with the main arrival taking place in late October and early November. Like Redwing they are also nocturnal migrants and can often be heard calling on the same nights. They have a harsh 'chack- chack- chack' call that is very different from the Redwing.

The Fieldfare is without doubt the most spectacularly marked of all our thrushes, it is also the largest, larger even than the Mistle Thrush. It has a light grey head and rump with a dark brown tail. The back and wings are a rich chestnut brown while the belly is white. However the most striking colouring is the rich ochre-yellow which extends from the throat down the front of the chest. Like the Redwing it also has a white stripe over the eye although it is not as prominent as on the redwing.

Photos: © Billy Clarke

Fieldfare

Fieldfares are quite hardy birds, more so than Redwings and as a result often stay at higher altitudes, only coming to the coast in hard weather. They also feed primarily on berries and other hedgerow fruits and are often seen in open fields foraging for worm, often with Redwings as both species mix freely. In the Spring the Fieldfare flies back to its Eastern and Northern breeding grounds.

When very cold weather arrives in the continent, both species fly west to Ireland to escape the freezing conditions which make feeding so hard for them. It is then that they can be seen in greater numbers than normal. If the cold prevails in Ireland and there is snow on the ground for more than a day or two both of these birds can be seen to visit gardens to take advantage of both garden berries and fallen apples. Often the simple task of putting a cluster of apples on the snow in your garden will bring these lovely visitors into your garden. Although many species are affected by cold weather, Redwing seem especially prone and many birds fail to survive a prolonged cold spell.

Declan Murphy, Office Administrator, BirdWatch Ireland, Rockingham House, Newcastle, Co. Wicklow.

Sam's Safety Rules

Hi, my name is **Safety Sam** and I love to play, to swim, to help out on the farm and to go fishing. But to enjoy all these things I must be safe and well protected. I also want you to "Be Safe and Stay Healthy". With help from these words can you help me fill in the blanks?

Answers on page 29

1	B	Check ——— in your fire alarms regularly (batteries)
2	E	In an ——— dial 999
3	S	When you enter public buildings always look for the exit ——
4	A	Never approach a dangerous ——
5	F	Farmers have these to keep animals secure
6	E	You should not disturb animals when they are doing this
7	A	Every house must have a fire ——
8	N	When should you become safety conscious?
9	D	Never swim at night, always swim during the —
10	S	At the beach always — parallel and near the shore
11	T	Check these tide —— before visiting the seashore
12	A	You raise this if there is a fire
13	Y	This type of child should never be left alone
14	H	Shout this when you are in serious trouble
15	E	Never go near this part of the cliff
16	A	Keep — from machinery
17	L	You should always — up dangerous chemicals
18	T	Reflective — is put on life jackets to make them more visible
19	H	You can come to this if you don't know the rules of the road
20	Y	Only swim between the two red and —— flags

From the booklet "Safety Sam Activity Book" – produced by Sherkin Island Marine Station

Our Fishing Expedition

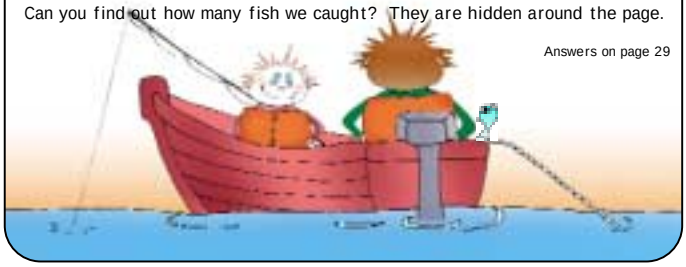
Safety Sam loves to go fishing with his Uncle Jim in their little boat called "The Gannet". Before they set off Sam does a Safety Check. Can you help him by filling in the blanks?

1. The sea is _ _ _ _ so it is safe to set out.
2. I am with an _ _ _ _ _ , my Uncle Jim.
3. Our boat, "The Gannet", is _ _ _ _ _ _ _ _ _
4. We are both wearing _ _ _ _ _ _ _ _ _ _ _
5. We have told Auntie Mary that we are going to _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
6. And Auntie Mary expects us back at _ _ _ _ _ _
7. We have checked the weather and there is going to be _ _ _ _ _ _ _ _ _ _ _ _ _ _
8. Uncle Jim has his _ _ _ _ _ _ _ _ _ _ _ _ _ _ in case of an emergency

seaworthy
mobile phone
a gentle breeze
lifejackets
Fisherman's Point
adult
8 o'clock
calm

Can you find out how many fish we caught? They are hidden around the page.

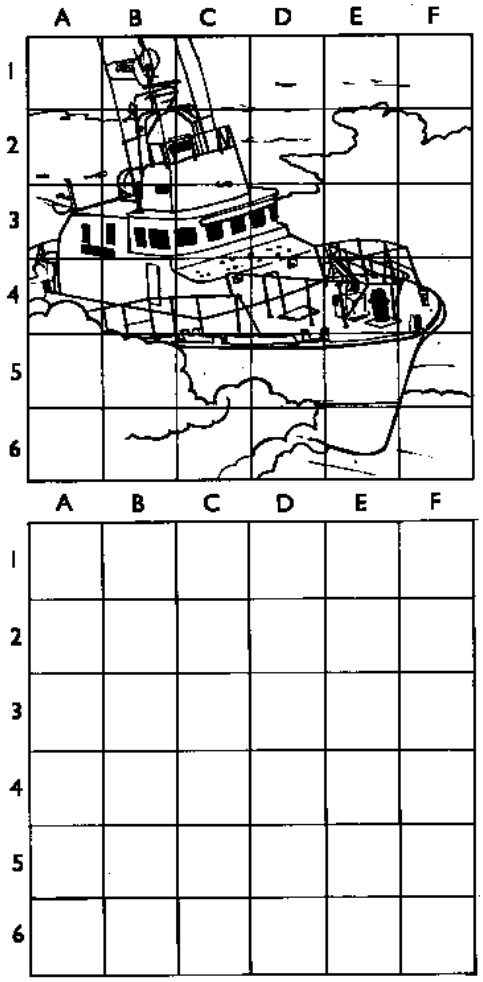
Answers on page 29



Sketches: © Sherkin Island Marine Station

STORM FORCE DRAWING LESSON

The RNLI (Royal National Lifeboat Institution) has many fine artists among its members, but for those who want to sharpen their skills or who have never drawn a lifeboat before, here is a simple way to practise: just copy this Arun lifeboat, one square at a time, from the top grid into the bottom grid. Before you know it, you'll have drawn your own Arun!
If you copy the empty grid on to a plain sheet of paper, you can have several attempts!



Sketches: © Storm Force (RNLI)

Join *Storm Force*

the RNLI's club for young people, and you will be sent an exciting members' pack filled with lots of goodies. Four times a year you will receive the action packed *Storm Force News* magazine full of exciting stories, paintings, ideas or jokes from Storm Force headquarters.

To join just send your name and address, with a cheque/P.O. for €7.50 to:
Storm Force HQ, RNLI, 15 Windsor Terrace, Dun Laoghaire, Co. Dublin.
Tel: (01) 2845050 Fax: (01) 2845052 Email: info@rnli.org.uk Web: www.rnli.org.uk

ANSWERS FOR "SAFETY SAM" ON PAGE 28

Sam's Safety Rules
1. batteries; 2. emergency; 3. Signs; 4. Animal; 5. Fences; 6. Eating; 7. Alarm; 8. Now; 9. Day; 10. Swim; 11. Tables; 12. Alarm; 13. Young; 14. Help; 15. Edge; 16. Away; 17. Lock; 18. Tape; 19. Harm; 20. Yellow.
Our Fishing Expedition
1. calm; 2. adult; 3. seaworthy; 4. lifejackets; 5. Fisherman's Point; 6. 8 o'clock; 7. a gentle breeze; 8. mobile phone. We caught 6 fish.

HERB STUFFED WHITING WRAPPED IN CRISPY BACON

Photo: © BIM

Warm up with whiting, filled with your favourite stuffing and wrapped in crispy bacon.

INGREDIENTS

- 4 whiting fillets – trimmed
- 4 streaky rashers

STUFFING

- 55g / 2ozs butter
- 1 onion – finely chopped
- 55g / 2 ozs brown breadcrumbs
- A small bunch of parsley
- A few sprigs of dill/marjoram/thyme
- Salt and freshly milled pepper

METHOD

- Soften onion in melted butter, add all stuffing ingredients.
- Cut fillets in half lengthways.
- Place stuffing on each fillet and wrap a thin slice of streaky rasher around each roll.
- Place in buttered ovenproof dish, cover and bake for 15 minutes at 190°C/375°F/Gas 5.
- Remove cover for last 5 minutes to crisp the bacon.
- Check seasoning and serve sprinkled with parsley and chives.

Serves 4.

BIM Bord Iascaigh Mhara Irish Sea Fisheries Board

FOR VARIETY

Substitute cod, haddock, hake, herring or mackerel.

FOUR GRUELLING DAYS!

the President's Award

By Declan Conroy

WHILE many people turn to confession or pilgrimages as a way of forgiveness I for some reason prefer to shed my sins through a tougher method.

This was achieved when I saw through a gruelling four days of hell in an army survival challenge in conjunction with The President's Award and the 2nd Field Artillery Regiment in the naturally landscaped and rolling hills of the Wicklow Mountains. I was joined by a further twenty-five other Award participants from throughout Ireland who had all decided like myself to apply for a chance of a place on the four-day event and who were lucky enough to be chosen to undergo this challenge from June 1–4.

While I had arrived at the McKee Barracks at 10am with the bare essentials I did notice some of my fellow participants arriving with suitcases and carrier bags. But it wasn't long before they were all swapped for army sacks. Splitting into five groups of five and joined by our soldiers we were then shipped off to another part of the barracks. There we were presented with proper army gear, before changing in record time and repacking our bags having reduced their contents to the important items. It was only then that everyone began to realise where we were and that we were receiving loud commands from all angles.

By 2pm we were packed into the army trucks and out of the barracks to later arrive at our first destination, Blessington Lake. We then began to make up our shelters for the night and when I say shelter that's exactly what they were – just a basic piece of canvas tied to four trees with our sleeping bags covering the stumps to keep out some of the mountains inhabitants. We were then given our dreaded ration packs – our food supply for 24–36 hours and our basic cooking equipment.

After a number of training lectures we were presented with our first team task. This was where we had to make a raft from barrels, rope and other materials scattered through the woods. This proved to be quite a struggle because apart from the fact that others tried to "steal" our barrels, it also didn't help that we hadn't a clue how to build one. By the end, our creation had similarities with the ill-fated Titanic. It had taken a long time to build, it was a tonne weight and the only thing that was yet to be tested was would it sink in water! By 9pm our day was done and with everyone in high spirits we took the time to make new friends before we made enemies throughout the days to follow.

Wednesday took off with an early start when we were literally dragged from our tents at 6am that morning. By 7am we were down at the lake treading through the muck with an unsteady raft on our shoulders and with icy water making our thoughts of a warm bath disappear. After many attempts to stay on the raft and with the water not getting any warmer we all decided that our only chance to get our raft to safety was to swim it across ourselves as it seemed that it was more at risk of sinking than we were.

After our first challenge we met with a speedboat that came to rescue us in our hour of need leading us to our second task which was close to a field of sheep where we then awaited our next journey this time via helicopter. This was beginning to leave me under the impression that we weren't going to have it half as hard as expected – that was until we were handed a map. Once the chopper landed and deposited us on top of a mountain somewhere in Wicklow.

While the sun was shining high on the picturesque mountainside, the surrounding view of mountain peaks were breaking through until they literally took our breaths when we were pointed towards our destination. After hours of trekking over sheep skulls and jumping into holes we finally reached our second base seven miles later without the help of our soldier who had earlier put us off a route that would have had cut our journey in half.

Following our minor expedition we later had to put, to the best of our ability, the remainder of our first-aid knowledge to use. This again proved very difficult having only brought a first aid kit and a stick for our 'false casualty' who, by the time we reached the ambulance, actually needed proper medical attention after receiving numerous knocks and falls during her haulage from the woods to the finish line. The only concern that I had was what would we have done had we encountered a real emergency and first aid was required from my teammates because our 'casualty' had 'died' the second we were left in control.

Once we had recovered from our second killer challenge we were then taken away to yet another unknown destination where we had the hardest task yet. This was one we were looking forward to as it involved fighting the soldiers for our second supply of food. Having dieted for 12 hours there was 26 angry faces, covered in green and black 'army muck', ready to take on anything within a ten-metre radius. The only disadvantage was that they had machines guns (don't worry – no injuries occurred), flares, booby traps, and night vision goggles while we had NOTHING. After 15 minutes of pure adrenalin and our eagerness to attack, there was no hesitation in running like vultures and getting to our food.

At 6am the following morning no one was in the mood for moving having only reached camp at 2am that night. We then made our way to the top of yet another mountain but this time it was a different story. Apart from the fact that the peaks were a lot more severe it was quite different as the only thing that could be seen was the tip of lit cigarettes smouldering in the rain. It was then that we had to get the mileage up and to do so we had to put our orienteering skills into full use. While everything was going according to plan amidst the fog and rain it all began to change when I got my hands on the compass. Although I did lead my teammates over the mountains I did accidentally miss one of the paths due to the fog. This led to tears, as an extra three-mile of misery, complaining and blistered feet was added on to our 10-mile route!

Eventually reaching Glendolough an hour later, our delight was noticed when we saw a chip van in the distance, this was our first recognition of proper food since mammies home cooking that Monday.

Once the short break ended we again were moved a few miles away where three ropes were laid across a cliff. This was great fun for some and hardship for more having to walk, crawl and swing from these ropes. This was later accompanied by a well-earned barbeque and learning fast we realised the more compliments thrown in the chef's direction the more food you got thrown.

The final morning was more than the limit for everyone, having to arise right at the crack of dawn, at just 5am. Arriving at Lough Dan for the final Challenge of the adventure was 26 sleepy and newly assigned canoeists who were all given the chance to paddle across the lake. After a kilometre of canoeing the fun was no longer to be seen as everyone was left sore, cold and tired.

After an uncomfortable sleep in the Army transport on our journey back to the barracks everyone began to look on the bright side as the event came to a close, especially when we had a shower, changed into nice clean, warm and dry clothes and were presented with our Certificates.

Although the gruelling parts were hell on earth the event was more than worth all the hardship, pain, food and the shouting.

It was fantastic to participate but one bit of advice – take the following week off for recovery!

Photo: © Declan Conroy

Declan Conroy on a Arial Runway over Jackson Falls, Laragh Co. Wicklow

For further information about the awards contact Mr. John Murphy, Chief Executive, The President's Award – Gaisce, Dublin Castle, Dublin 2. Tel: 01-4758746 Email@p-award.net or Website: www.p-award.net

Sherkin Island Marine Station Environmental Competition

for Primary School Children in Munster 2004

Photos: © Sherkin Island Marine Station

Above: **Scoil Mhuire, Tallow, Co. Waterford.** Cllr. PJ Sheehan, Mayor of Cork County presenting the prizes at the Carrigaline Court Hotel, Carrigaline, Co. Cork. Also present are Mr. Bob Cooke, BIM, Ms. Geraldine Rooney, Pfizer Ireland Pharmaceuticals, Mr. Jim Murphy, Janssen Pharmaceutical Ltd; Ms. Patricia Power, Cork County Council, Mr. Paul Bourke, Central Fisheries Board and Mr. Matt Murphy, Sherkin Island Marine Station.

A BIG THANK YOU to all who entered Sherkin Island Marine Station's *Environmental Competition for Primary School Children in Munster 2004*. We had a marvellous response to the competition and a wonderful day at the prize-giving ceremony at the Carrigaline Court Hotel, Carrigaline, Co. Cork, where Cllr. PJ Sheehan, Mayor of Cork County, presented the prizes.

We would like to take this opportunity to again thank our sponsors for this year. They were: BIM (Irish Sea Fisheries Board), Central Fisheries Board, City Print Cork, Cork City Council, Cork County Council, Denis McSweeny Photoshop, Cork, Dept. of the Environment, Heritage & Local Government, Evening Echo Newspaper Cork, Janssen Pharmaceutical Ltd. and Pfizer Ireland Pharmaceuticals.

Here is a very small selection of some of the 405 prize-winners.

Above: **St. Michaels Clerihan NS, Clerihan, Clonmel, Co. Tipperary.**

Above: **Shanbally NS, Ringaskiddy, Co Cork.**

Above: **Oola NS, Oola, Co. Limerick.**

Above: **Fenor NS, Fenor, Co. Waterford.**

Above: **St. Finbar's NS, Gillabbey St., Cork.**

Above: **Bealad N.S., Clonakilty, Co. Cork.**

Sherkin Island Marine Station Environmental Award 2003

By Matt Murphy

I HAD great pleasure in presenting our Sherkin Island Marine Station Environmental Award for 2003 to Jim Wilson. Many of you have, over the last few years, heard his wonderful Cork accent on the radio programme *Mooney Goes Wild*. What comes across is his love and enthusiasm for birdwatching, especially so on the programme's annual feature on the *Dawn Chorus*.

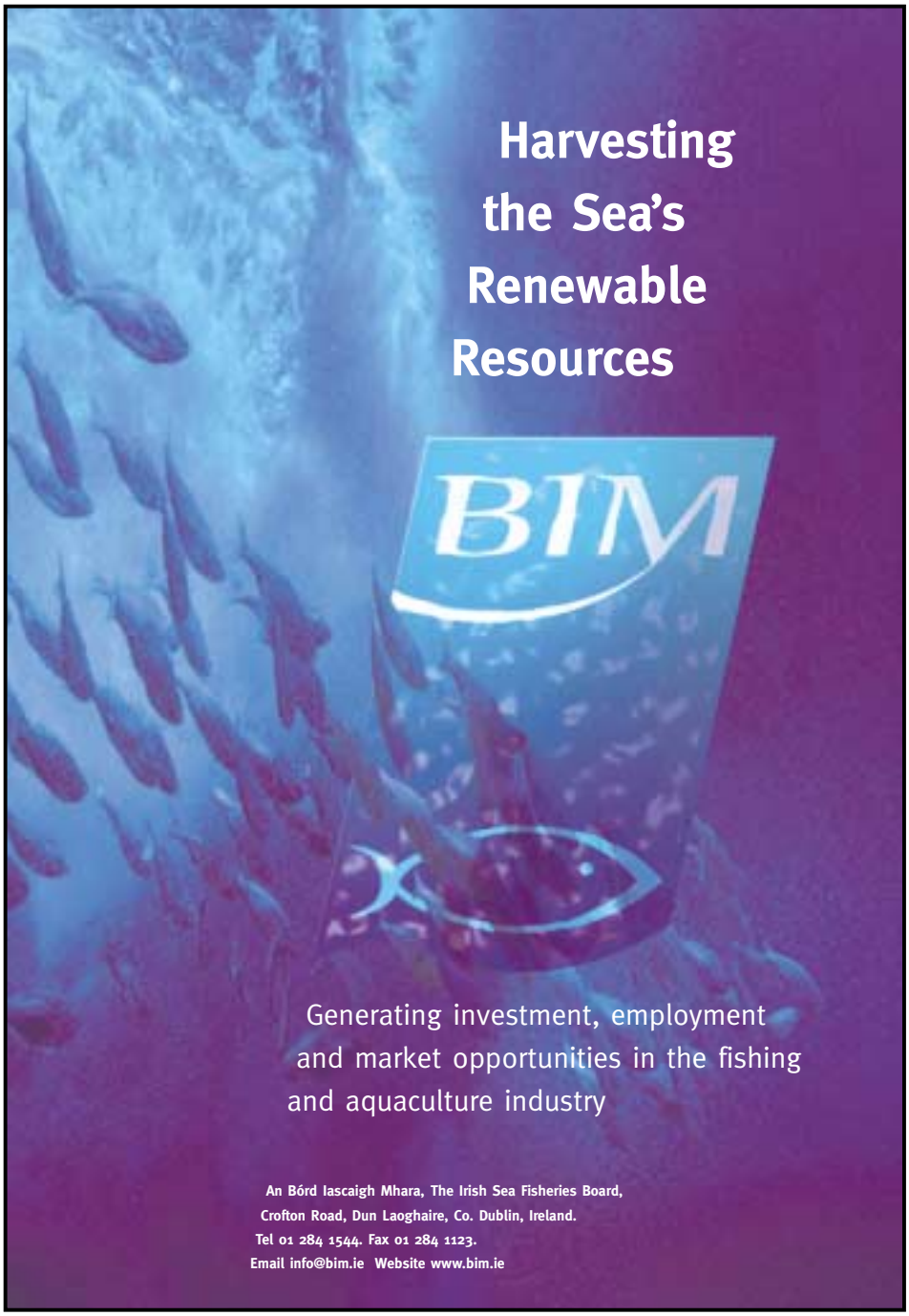
Jim lives in Cobh, Co. Cork, with his wife Ann and two children. He has been interested in Irish wild life since childhood. In fact he still has his first nature notebook, which dates back to 1972. His father was one of his great influences when it came to natural history, as well as Eamon de Butleir, Gerrit van Geldren, and the late Clive Hutchinson of Cork.

Jim has a particular interest in Ireland's common wildlife, establishing Birdwatch Ireland's Winter Garden Bird Survey in the early 1990's. Over the years he has been a regular contributor to the wetland bird surveys co-ordinated by Birdwatch Ireland. He also wrote a book on birds and birdwatching in Ireland for beginners, illustrated by Don Conroy (*Bird Life in Ireland*, O'Brien Press 1994). In more recent years he has broadened his interest to all aspects of our natural history. He takes every opportunity to "spread the word", giving talks and advice to schools and other groups wherever and whenever possible. He is volunteer manager of Cobh's local Birdwatch Ireland Reserve at Cuskinny Marsh, and with the cooperation of the local landowners, teacher Willie MacSweeney and pupils of Scoil Iosaef Naofa in Cobh, he has established a long-term study of nesting birds through talks and field trips. For the past 14 years the pupils have monitored songbirds nesting in nest boxes on the reserve as well as recording their observations on their regular visits to Cuskinny.

Jim believes that Irish wild life is as interesting and exciting as anywhere in the world, something with which I totally agree. One of his most important aims has been to heighten people's awareness of the incredible natural heritage we have here in Ireland and campaigning for its protection. He does this through his regular contributions to *Mooney Goes Wild* and the production of radio and TV specials, including the *Dawn Chorus*. He now spends most of his free time filming Ireland's wild life and has had some of his work shown on RTE television. He believes there should be a network of state run nature reserves around the country, which would show off our natural heritage and provide a facility for schools, tourists and Irish people to go and see first hand our many natural treasures.

Jim compiled the *Cork County Bird Report* for four years. He was national chairman of Birdwatch Ireland, then the Irish Wildbird Conservancy for three years. He is currently a member of the scientific committee of Kilcolman National Nature Reserve in north Cork. Among other things he is currently working on an educational project for the Irish Whale and Dolphin Group.

In this day and age it is wonderful that there are people like Jim who are interested in creating a love of the outdoors for young people. Long may his efforts continue.



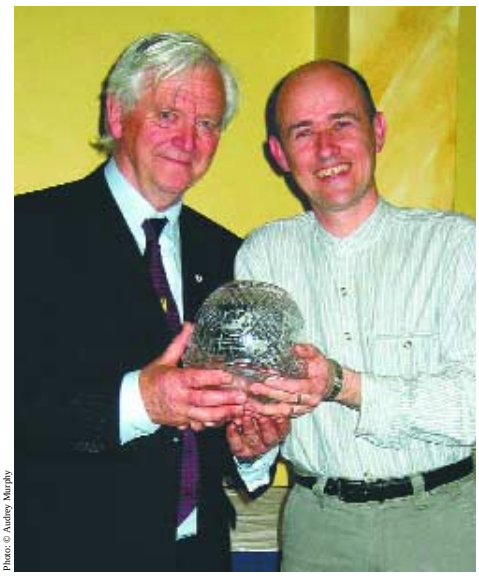


Photo: © Audrey Murphy

Jim Wilson being presented with the Sherkin Island Marine Station Environmental Award 2003 by Matt Murphy

Matt Murphy, Sherkin Island Marine Station, Sherkin Island, Co.Cork.