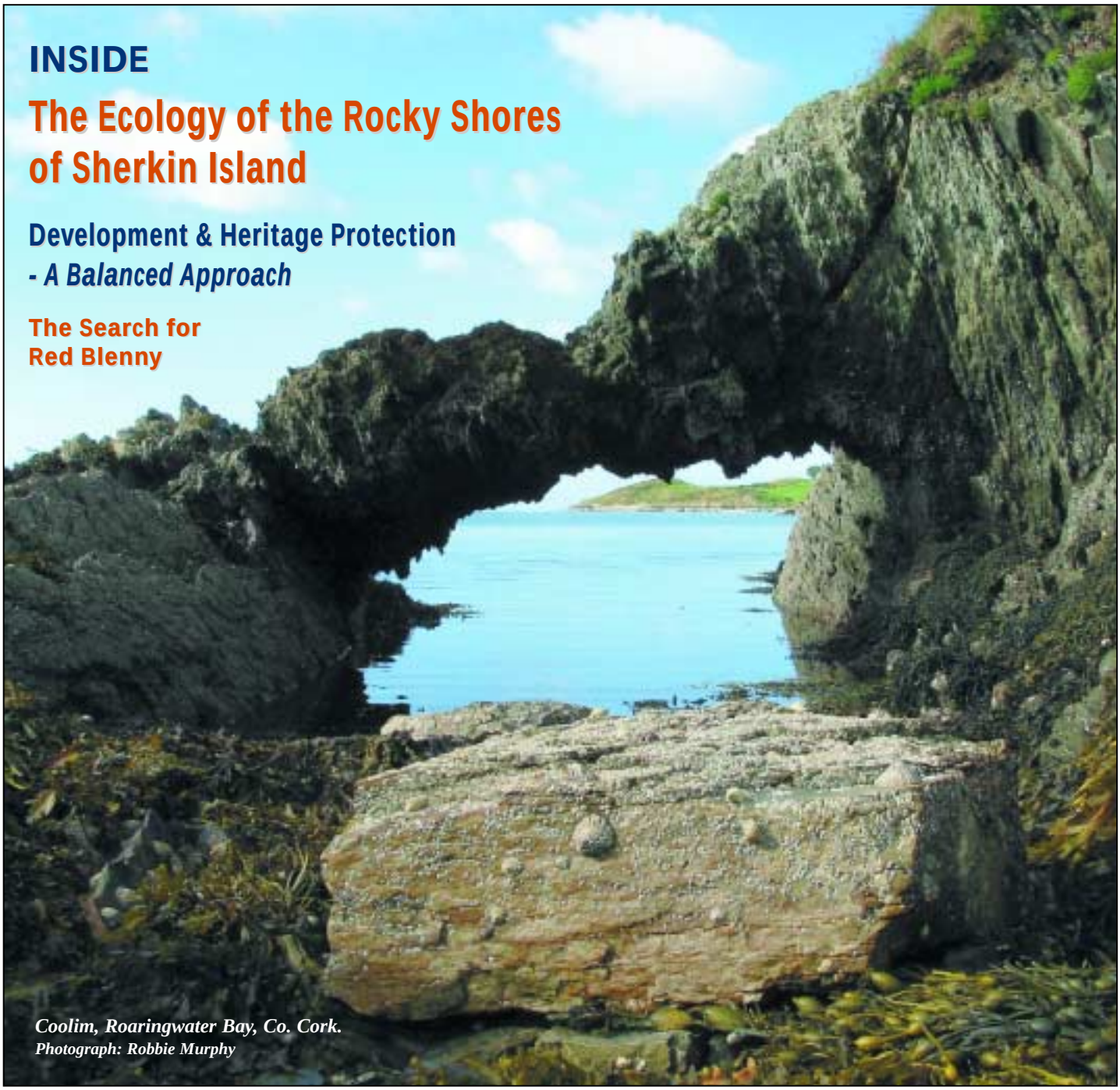
SHERKIN COMMENT

Issue No. 35 Environmental Quarterly of Sherkin Island Marine Station 2003

INSIDE



Coolim, Roaringwater Bay, Co. Cork.
Photograph: Robbie Murphy

Contents

Editorial

A Major Investment in Wastewater Infrastructure

By Matt Murphy

EARLIER in the year the Minister for the Environment, Heritage and Local Government, Mr. Martin Cullen, T.D., outlined a major investment programme in sewerage infrastructure. Because of the significance of such a programme for the good of the environment, this editorial will highlight the important aspects of the sewerage programme.

This investment programme 2003-2005 will cover 434 wastewater schemes. It is funded under the National Development Plan, which will ensure every single location in the country with a population equivalent greater than 1000 will have its own waste water treatment plant.

If this programme is delivered it will be a remarkable turnaround from what prevailed up to relatively recently where some of our major cities and towns were discharging wastewater with little, or in some cases, no treatment. There will thus be an increase in Ireland's compliance with the 2005 EU Urban Wastewater Treatment Directive (UWTD) standard from 25% at the start of the NDP, to the current level of 69%, and a projected 87% compliance rate by the end of 2003. Full compliance is anticipated by the end of 2005.

The Minister pointed out that "the great strides" to eliminate discharges of untreated sewage to the sea from the main towns and cities around the coast. "The Ringsend Treatment Plant in Dublin, is a prime example. This new plant, built at a cost of €286 million will deal with the wastewater treatment requirements of all of Dublin City and most of the Greater Dublin Region. It is the biggest wastewater treatment plant anywhere in the EU and will produce the single greatest improvement ever in the quality of Irish coastal waters. It will give Dublin City a range of Blue Flag beaches right on the doorstep. By the end of this year Cork, Limerick, Galway and Wexford will also have new wastewater treatment plants in place and operational".

Since 2000, Local Authorities have seen the completion of new wastewater facilities at the major coastal towns of Dundalk, Drogheda, Midleton, Westport and Courtown/Riverchapel. In addition to Dublin, state-of-the-art treatment facilities are in place and operational in Cork, Limerick, Galway and Wexford and many other smaller urbans. Other major projects under construction, or due to start to include new sewerage schemes for Bantry, Bray/Shanganagh, Dungarvan, Portlaoise, Sligo, Thurles, Tramore, Tullamore and Waterford.

Huge steps have and are being taken by the Minister and his Department, surely it is time for those that want more environment care of our country to be more positive in reaction to investments by Government and Local Authorities. Maybe a little more of looking at a glass half full rather than half empty would be a better approach. As a people we rarely give credit for achievements. This new programme for 2003-2005 deserves praise if it achieves its goal by 2005 or even 2006. Then the quality of Ireland's lakes, rivers and coastal waters will have improved greatly.

The Minister and his predecessor have taken major decisions on environment care, such as the plastic bag, recycling, the Water Services programme, and now the Sewerage initiative. At times both have ruffled some feathers but have shown that they had the courage to drive forward often against opposition from many quarters.

It is hoped that the Minister will now examine other environmental issues that need an enlightened approach. The EU have taken legal proceedings against Ireland under the Groundwater, Birds and Habitats Directive. There are genuine issues to be addressed, especially:

- Inadequate designation of SPAs (Special Protected Areas) for dispersed and migratory bird species.
- Inadequate protection of SACs (Special Areas of Conservation) and of non-native bird species.

Carlow	5
Cavan	11
Clare	20
Cork	61
Donegal	48
Dublin	27
Galway	39
Kerry	11
Kildare	11
Kilkenny	8
Laois	8
Leitrim	5
Limerick	12
Longford	8
Louth	9
Mayo	25
Meath	12
Monaghan	8
Offaly	10
Roscommon	7
Sligo	13
Tipperary	22
Waterford	18
Westmeath	14
Wexford	15
Wicklow	7
TOTAL	434

Wastewater Schemes in each County to benefit from the new investment

SUBSCRIPTION INCREASE

Unfortunately due to ever-increasing postage costs we have had to increase the subscription rate for *Sherkin Comment*

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HERRING GULLS
THEIR RISE AND FALL

By Oscar Merne

Photos: © Oscar Merne

One of the most dramatic declines has been recorded on Great Saltee Island, Co. Wexford.

Following the Seabird 2000 survey and census, it has become clear that the Herring Gull situation in Ireland is alarming.

ALTHOUGH one of the commonest of our seagulls there is a dearth of information on numbers in Ireland prior to 1969-70, when the first full survey and census of breeding seabirds was carried out in Britain and Ireland. At the end of the 19th century Herring Gulls were almost exclusively coastal in distribution, rarely appearing inland. By the mid-20th century the species was regularly seen inland and a number of breeding colonies had been established, mainly on islands in large lakes such as Loughs Neagh, Corrib, Mask, Conn, Ree and Derg. There was also a general perception that numbers had increased in coastal areas, but there is little quantitative information available. The 1969-70 survey and census produced a grand total for Ireland of 59,700 breeding pairs, though this did not include the relatively small numbers breeding inland.

The overall increase in numbers of Herring Gulls in Britain and Ireland since the beginning of the 20th century has been attributed to a combination of reduced persecution and egg-collecting, and to a great increase in year-round food resources, including fishing waste (offal, discards), rubbish dumps, sewage outfalls, abbatoirs, and the species' adaptation to inland feeding on agricultural lands.

Looking back three decades or so to the 1969-70 survey and census it seems that this may have coincided with a peak in Herring Gull numbers, for declines began to be noticed at some colonies soon after. A seabird survey and census carried out in the mid-1980s indicated a significant overall decline in Herring Gull numbers to c.40,000 pairs. Just recently, the final results of the Seabird 2000 survey and census have been computed and it has become clear that the Herring Gull situation is alarming. Only a little over 6,000 breeding pairs were found in Ireland, representing a 90% decline over thirty years. It seems that avian botulism may be the main cause of this decline, and the long hot summer of 1976 seems to have encouraged the establishment and spread of this disease, which killed large numbers of adult breeders and their chicks at some colonies. This seems to be an on-going problem and it is thought that much of it arises from the habit of Herring Gulls feeding in rubbish dumps, where black plastic bags with organic waste are a common feature of the tip-heads. The warm, dark, humid and anoxic conditions in the bags may be conducive to the multiplication of the *Clostridium botulinum* bacteria, which produce a toxin that the scavenging gulls ingest when they slash open the bags for tit-bits. Most infected birds die within 48 hours, and their chicks die from infected food brought back by the parents, or of starvation and exposure when the adults are incapacitated. It's a very sad sight to find dead and dying breeding Herring Gulls and their young littered around a colony.

In Ireland most of the declines have been on the east and south coasts, where the weather tends to be warmer and drier, and therefore more conducive to botulism, and where foraging adults are more likely to be within reach of large rubbish dumps. One of the most dramatic declines has been recorded at the well-monitored colony on Great Saltee Island, off the Co. Wexford coast. In the early 1970s there were 3,000 pairs of Herring Gulls nesting on the island: now there are 27 pairs left, and botulism is still taking its toll. Another major decline has taken place on Lambay Island, Co. Dublin, although the situation there is more complicated than on Great Saltee. Botulism is certainly a problem there, but some of the decline is probably due to deliberate culling carried out in the 1980s, when the large breeding population (20,000) was deemed to be a hazard to aircraft landing and taking off at nearby Dublin Airport. In addition, agricultural improvement of large areas of rough vegetation has greatly reduced the nesting habitat, and early mowing sometimes destroys nests. Nearby Ireland's Eye has also suffered a decline, with a major contraction of the Herring Gull colony to slopes and rocks on the eastern edge of the island. Bray Head and Wicklow Head, the main colonies on the Co. Wicklow coast, now have but a handful of breeding Herring Gulls. In Northern Ireland there have been major declines on Rathlin Island, the Copeland Islands and at Strangford Lough.

I mentioned earlier the culling of Herring Gulls on Lambay Island. It has to be said that culling has been carried out elsewhere, where very sensitive and important tern colonies have been vulnerable to egg and chick loss to predatory Herring Gulls. Back in the 1950s and 1960s there was a general perception the Herring Gulls were becoming too numerous and were having an adverse impact on other breeding seabirds. Therefore it was considered "a good thing" to cull them or destroy their nests. However, now that the species is in serious trouble, at least in parts of its range, control measures such as culling should not be carried out unless there is a major justification for it, and after non-lethal methods have been tried and found ineffective.

Oscar Merne heads the Bird Research Section of the National Parks & Wildlife Service, Department of the Environment, Heritage and Local Government, 7 Ely Place, Dublin 2.

Only a little over 6,000 breeding pairs were found in Ireland during the last survey and census - a decline of 90% over thirty years.

Elements of Medicine

By Anthony Toole

THROUGHOUT the history of medicine, remedies for all ailments have appeared and disappeared with fashion and the centuries. Some had their origins in folklore, others emerged from the not unrelated, darker recesses of witchcraft and alchemy.

With the introduction of the scientific approach, a number of these cures have been found to be effective. The mechanism of their curative properties is understood, and they are now incorporated into modern practice. On the other hand, some old remedies are known to have been ineffective, while a few were quite dangerous.

The poisoner's favourite, arsenic, for example, has been used to treat illnesses as diverse as TB, diabetes, malaria, rheumatism and syphilis. Its close relative, antimony, used to cure skin complaints, and to induce vomiting, as tartar emetic, may have been responsible for the premature death of Mozart.

Mercury compounds were often used in skin ointments, despite the fact that this deadly metal could be absorbed easily through the skin. Another element favoured by murderers, thallium, was employed, often to dangerous levels, during treatment for ringworm, one symptom of its toxicity being hair loss, which exposed the infection and thus made it easier to treat.

Of course not all of these cures held significant dangers for their recipients. Among the more benign and beneficial were the uses of iron to cure anaemia, magnesium salts for constipation and indigestion and iodine as an antiseptic and for problems with the thyroid gland.

Despite the dangers, modern medicine continues to employ toxic elements in cases where there appear to be no safer alternatives.

The soluble salts of barium are poisonous, and if swallowed, cause vomiting, diarrhoea and ultimately, paralysis. Even the insoluble barium carbonate reacts with stomach acids to form a solution of barium chloride. On the other hand, barium sulphate is almost entirely insoluble, and will pass safely through the digestive system as a suspension of solid particles, which is opaque to X-rays. If a patient is given a 'barium meal', X-rays can then be passed through the stomach to reveal ulcers or tumours that would otherwise be invisible.

Bismuth belongs to the same family group as arsenic and antimony, and though it salts, in excess, can cause liver damage, it is much less poisonous. As the nitrate and carbonate, and more recently as the citrate, it has been used as a treatment for stomach ulcers. It appears to work by killing bacteria that cause ulcers and by protecting the stomach wall against enzymes that otherwise attack it.

Some compounds of aluminium, such as the alums, have been used for nearly 2000 years to stop bleeding. Other elements that lie in the same group, such as boron, gallium and the already mentioned thallium have their uses in modern medicine.

Boron is a non-metallic member of the group. Its atoms can be attached to chemicals which, when injected into the body, tend to concentrate in tumour cells, particularly those in the brain. When exposed to a beam of neutrons, these boron atoms become radioactive, giving off alpha rays, which kill the tumour cells. As the alpha rays cannot travel far in dense material (they can be stopped by a sheet of paper), they do minimal damage to surrounding healthy cells.

A radioactive form of gallium also concentrates in tumours that may occur in soft tissues of the body, such as the liver, spleen or lymph nodes, and can be used to diagnose such tumours, which would otherwise be difficult to detect. It is also used to treat skin cancers, like melanoma and to monitor the treatment of bone tumours in children. A non-radioactive compound of gallium has recently shown promise in treating malaria when more traditional drugs have failed.

Atoms of the toxic metal thallium closely resemble those of potassium and can be mistaken for such by the body. Radioactive thallium, when injected, finds its way to the heart, in the guise of potassium. The gamma radiation emitted can assist in the diagnosis of heart disease. The radioactivity decays rapidly and the thallium will be eliminated from the body after a few days.

A radioactive isotope of yttrium can be attached to antibodies that attack cancer cells in the colon, bones, ovaries and pancreas, and can be used to destroy these cells.

Technetium is an element that is always radioactive. Any atoms that may have existed in the early earth have long ago disintegrated, so that the metal can now only be made in nuclear reactors. It is used in the diagnosis of cancers and to show up damage resulting from a heart attack. The residues formed by the decay of technetium are only mildly radioactive and are quickly eliminated from the body.

Lanthanum is known as a rare earth element, though it is much more abundant than better known metals like lead and tin. The carbonate of lanthanum is often added to the diets of patients with kidney disease to prevent the absorption of phosphates through the gut. The excess of phosphates that might otherwise be absorbed can cause painful bone deformities, as calcium phosphate is the main constituent of bone.

Even the genuinely rare and expensive metals find their places in medicine.

Sixty tons of gold each year are used in dentistry. Gold fillings contain 75% of the metal. Gold compounds are also employed to treat rheumatoid arthritis, though the side effects of the build-up of gold, which include diarrhoea and skin rashes, mean that the treatment has to be discontinued after a few years.

Platinum is even more expensive than gold. Cis-platin, a complex of platinum with chlorine and ammonia, combines with DNA in cells and prevents replication. Because of this, it is used to kill cancer cells. Unfortunately, it has the same effect on healthy cells and can cause breathing problems and vomiting. Nevertheless, cis-platin brings about a 90% cure rate for some cancers.

While the medical uses of these elements continue to expand, and more diseases fall under their control, one must not lose sight of the toxicity of many of them. With greater understanding and monitoring of their effects, these can now be prescribed in quantities that ensure that the benefits vastly outweigh the dangers.

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Pipeline Installation in Aquatic Settings

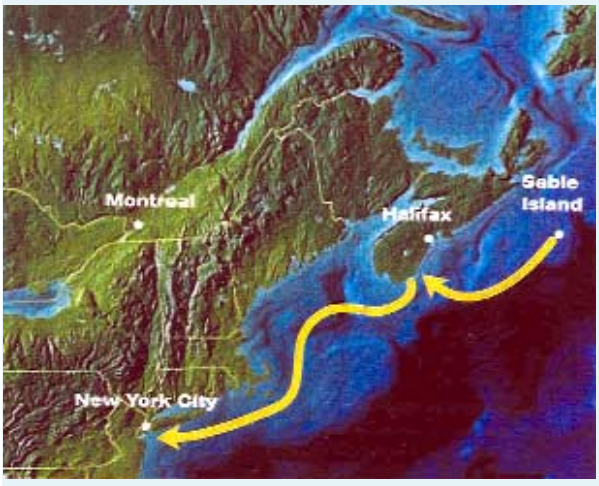
By Michael Ludwig

NATURAL gas, electricity and telecommunications transmission systems are expanding to meet increasing usage. This expansion is, often times, a competition of proposals to supply markets such as Boston, Massachusetts and Long Island, New York. In a growing number of distribution proposals, right-of-ways are being located in, over or under aquatic environments. The shift in routing arises from improved technologies for aquatic installations and the difficulty in obtaining land routes. Sadly, pipe and cable alignment proposals are driven, often, by the location of existing, land side infrastructure and without thorough consideration of aquatic impacts. A further complication is the varying missions of Agencies in the United States that regulate pipeline and cable installations.

Although newer technologies are designed to minimise environmental impacts or achieve compatibility more quickly, they do not eliminate damage to resources and habitats within and adjacent to the construction and operation right-of-way. Often, utility line (cable and pipeline) impacts can occur during installation or operation. However, through design, installation and operation management practices these impacts can be characterised and dealt with.

Horizontal directional drilling (HDD) allows the installation of utility lines well beneath sensitive areas such as trout or shellfish habitats. HDD can create conduits more than 1500 meters in length. HDD point to point accuracy can be remarkable. But, the system requires the use of "drilling mud," a mix of clay and water, pumped to the cutting face of the drill. The mud provides lubrication and cooling for the drill head, clears away the cuttings by flushing them to the surface and, also, helps push the drill along. Because drilling mud creates pressure, it can be squeezed out of any cracks along the borehole route. In such a "frac-out," the mixture of freshwater and clay (sometimes with additives) escapes into the waterway and can create problems. The mud has the consistency of thick soup and when released in water, doesn't readily disperse. It often sits on the bottom like a whipped pudding, covering and suffocating organisms unable to move from beneath it. Cleanup is difficult because the material is a liquid sitting in a liquid. A vacuum and filtering system is the usual recovery method. Although HDD is touted as a simple and safe method of avoiding impacts to surface ecosystems, the procedure requires a through understanding of the geology of the installation route, close attention during deployment and a recovery plan should a frac-out occur.

Hydraulic jet fluidises seafloor and cable sinks into bottom.



Proposed offshore gas pipeline from Nova Scotia to NY City.

Burial of cables and pipes is now routinely required. Burial reduces the likelihood of snagging and eliminates the "barrier to migratory bottom crawlers" issues. Line burial seems simple and appropriate to meet the "passive presence" objective. For instance we are considering a proposal to build a 1.2-meter diameter gas pipeline from Nova Scotia to New York. Because it would traverse the continental shelf at right angles to the migratory movement of crustaceans such as American lobster and cancer crab, burial is being discussed. To get a sense of the issue, imagine a 1.8-meter tall human trying to pass over a pipe wall that rose up 23.4 meters above the ground. It offers no handhold opportunities and the first half of the climb requires crawling upside down on the underside of the pipe. Most crustaceans do not like being on their back

We want utilities buried, but how deep? The deeper one buries a line, the more effort is needed, the harder it is to maintain, the more habitat is disturbed and restoration is more complicated. We usually seek full burial but not less than half burial (any deeper may not result in any added benefits). Because seafloor sediments are composed, typically, of mud and sand and both are movable, burial can be relatively easy. Of the burial options available, we prefer jets and plows for cables and just plows for pipelines. Jets use high pressure water discharges to liquify the seafloor in the area beneath the line and the weight and flexibility of the cable allows it to sink into the created trench. Repeating the operation may be necessary to obtain the desired depth. Plows cut a furrow much like their smaller, land version, but include directing the line into the created trench. Subsequent passes are made to attain a deeper insertion or replace the displaced sediment.

Photos: © Michael Ludwig

Pipeline burial plow for use in mud.

Cable laying ship that does not need to anchor during installation.

While none of the installation techniques is perfect, the impacts can be localised within a modest construction corridor. Installation techniques vary from a simple passage of a cable laying ship and jetting operation to multi-anchored, pipe-laying and plowing operations to the use of explosives and dredges. The impact zone can vary in width from about a meter to more than a kilometre. The rate of habitat recovery varies with local conditions. For instance, in deeper waters, where sediments are stable, pits and ridges can last for decades, while in nearshore waters where waves and currents are active, habitat recovery may be achieved with the passage of the next storm. Full recolonisation of an area after habitat recovery, typically takes two to five years.

Utility lines are a vital part of our infrastructure, however, there is no reason they can't be made an environmentally compatible and passive presence in our ecosystem.

Michael Ludwig, NOAA/NMFS, 212 Rogers Avenue, Milford, CT, USA 06460-6499.
Pictures obtained from recent permitting actions by the author.

The Search for Red Blenny

Climatic Change or Insufficient Data?

By Paul Kay

AS underwater photographers we all need to be keen observers of the undersea and its natural history, if for no other reason than trying to identify good subject matter. And being in the marine environment, this more often than not means watching its inhabitants and shooting natural history photographs.

Now I am not a marine biologist (despite having been described as such in various diving magazines), and would much rather classify myself as a marine naturalist. In this role I am the equal of anyone else who dives, as I can make observations of the species I encounter and their behaviour firsthand, and, providing I try to understand what I am seeing, am quite able to see things which are currently unrecorded (or at least impossible to find any existent records of).

This was brought home to me when I got a roll of film back from Glasson Rock of Inish Mór in the Aran Islands, Galway Bay, Ireland. This is a spectacular dive. You can follow a ledge along a sheer limestone wall until a boulder slope appears below. Many fishes, crustaceans and invertebrates make excellent subject matter (the cuckoo wrasse are tame despite not being diver fed), but it was one pretty red 'Tompot' Blenny which caught my eye.

Photos: © Paul Kay

An identifying shot from the Aran Islands showing a male Red or Portuguese Blenny (*Parablennius rubber*) in breeding colours.

I was using a Nikon 28~105 zoom lens on my Subal encased F100 and two Nikonos SB105 strobes. This acts as a 50~105 macro lens capable of focussing down to just a few centimetres, and whilst not giving quite as close focus as either a 60 or 105 micro-Nikkor, it makes up for this in terms of versatility. Well, to get back to the 'Tompot', it was sitting on a rock and allowed me to zoom to 105 and compose. I took a couple of shots.

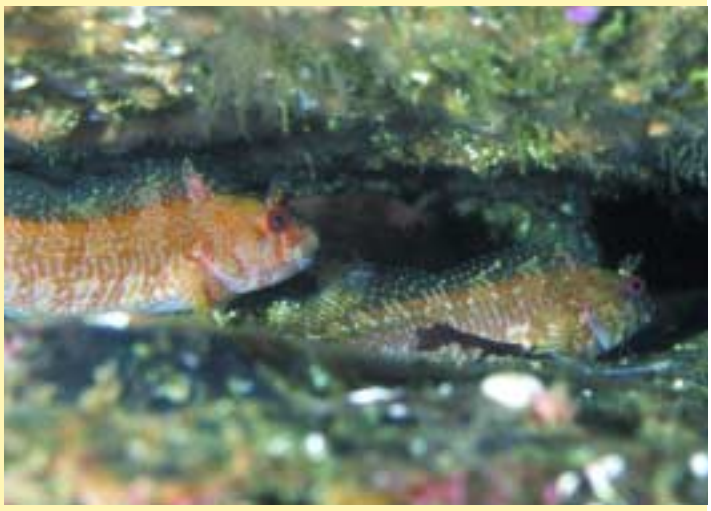
As with many pictures, it isn't until they are back and on the lightbox that anything 'special' is revealed. This was the case here. Under the loupe, the Provia transparency showed a fascinating but strange feature of the 'Tompot'. It had a yellow fringed, very dark blue spot towards the front of its dorsal fin. Now I've seen a lot of Tompot blennies but never one with such a marking, and it looked odd in other ways, as the body was not so 'stout' as a normal Tompot's and the eye did not seem quite 'normal' either.

So I sat down with my books (a vast collection made over the last twenty years) and drew a blank. No temperate book contained anything remotely like this. So what was it? Well as Sherlock Holmes would undoubtedly have deduced, when the probably is exhausted move on to the improbable, and I did.

Eventually I located a similar looking fish in Peter Wirtz's book *Underwater Guide Fish - Madeira, Canary islands, Azores*. This did not show the spot, but the eye and a blue patterning on the fish's face did look similar (I had thought this just a variation on a Tompot's colouring). I queried the book's author (an expert on Blennies) regarding my fish by emailing a jpeg file off to him (the wonders of technology) and it was soon confirmed, I had photographed a Red or Portuguese Blenny.

Not only this, but the fish I had seen was a male in breeding colours (the picture was taken in June this year) and this was the cause of the spot - although in my specimen this was apparently very pronounced.

A Tompot Blenny off the north Wales coast.



Another picture of Red Blennies, this time from south Kerry. This photo illustrates that, unlike Tompots, Red Blennies are gregarious.

Photos: © Paul Kay

A Tompot Blenny within a few meters of the breeding male Red Blenny off the Aran Islands.

Now here's where the fun starts; just what does this isolated record mean?

I had some detective work to do. A round robin email to people I thought may be able to answer this revealed one confirmed record in the Scilly Isles, and also that more information was being sought about this fish's distribution in Ireland.

Having now ascertained that I was not looking at a Tompot and having determined the nuances other than the spot which were different to an ordinary Tompot, I started to wade through my many thousand underwater photos from Ireland. I now had a nagging suspicion that I had seen this fish before. And sure enough I found it.

The previous year I had dived in south-west Ireland and had photographed a group of Tompots in a crevice. This was in itself unusual as Tompots don't tend to be very gregarious, but I had not really thought a lot about this at the time. As I reviewed the photograph it was clear that these too were red blennies.

I searched further and sure enough another photo appeared. This time from St. Kilda! Not the world's best photo but one I had taken when my old SB103s had been playing up (old age - I'm very grateful for Nikon's recall). This again showed the red colour and blue patterning. Next I started on photos by my wife Lucy, who is also a diver. Lucy's pictures revealed another, again in a crevice and this time from Islay, in Scotland.

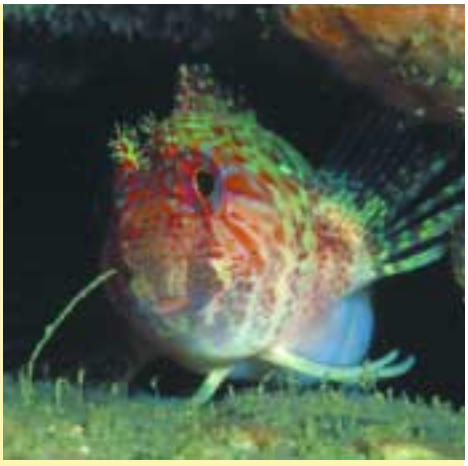
Not a Tompot nor a Red Blenny, this is actually a male Butterfly Blenny guarding his eggs in Cardigan Bay, Wales.

Another friend has a nice photograph of a reddish Tompot that he took, framed and on his wall. Next time I called on him I examined it. Another one and from Kilda again! Recently I found that my searches were not unique. Nigel Motyer has had the same problem having seen the fish for years - he too finally identified it as the same Red Blenny. He added more records from Kerry to Donegal.

So we now know that the Red or Portuguese Blenny can be found all along the western Irish and Scottish Coasts. But what does this mean?

Well it is tempting to think that it is an indicator of that in-concept Global Warming. Now whilst scientific evidence backs warming thoroughly, there is very little reason to believe that its effect will be the shift of 'southern' species northwards especially in the short term. In fact there is as much discussed about alterations in the Gulf Stream and what they might mean (it could cool down our own (temperate enough) seas. So the occurrence of one unusual fish in an area that it has not been recorded from before, is not an earth-shatteringly important event!

It is though a fascinating glimpse into what we are able to see for ourselves, something unusual enough to be overlooked by the academics and authors of many books. Perhaps it is something that should reinforce what we already know - that the marine environment is still a poorly understood place where observational skills can still reveal the unexpected, and where the camera is still coming into its own. Without a photograph, I would not have identified this fish as anything other than a Tompot and it is quite likely that it would have been far longer before anything went into print about its distribution



A Red Blenny in a crevice off the coast of Islay in south west Scotland.

Paul Kay BSc FRPS runs the Marine Wildlife Photo Agency in Angelsey, North Wales, UK.

Website: www.marinewildlife.co.uk

ICE

Photos: © John Gore-Grimes

"I will never go back to the ice again!"

By John Gore-Grimes

Arctic Fern

JOHN GORE-GRIMES sailed *Arctic Fern* from Howth to Northern Iceland and then to Scorseby. He proceeded northwards on the east Greenland coast stopping at Daneborg and Shannon Island. He went to the south end of Store Koldewey before turning to the east. The narrative here describes part of his voyage through the ice. He eventually tied up at Longyearbyen in Svalbard and sailed from there to the North Cape. From the North Cape he sailed to Tromso and the Lofoten Islands and from there to the Faroes, Scotland and home again to Howth. The voyage was just in excess of four thousand six hundred nautical miles. John was accompanied on this voyage by his nephew, Nicholas Gore-Grimes, Adrienne Roche, Rob Harris and Karen Rudd. John's boat, *Arctic Fern*, is a 44 foot auxiliary sailing cutter built by Njad of Sweden.

For those who have never been in ice, the sight of even one small chunk is a great source of delight. It has to be photographed, not once but twice and from every angle. When these early photographs are developed, they are binned with a certain amount of silent shame as, later, many more photographs produce dramatic images. For those who have been there before, there is a certain inevitability about sea temperature at two degrees and drift ice floating by. It looks nice enough but you know that soon you will lock horns with it and you will feel a sense of almost uncontrollable fear and depression. Just as the solid ground is a sure cure for sea sickness, the only cure for ice is to get out of it. The trouble with sea ice is that it gets under your skin and when you leave it you, at once, start to forgive it, although hours before it may have caused you considerable grief. As the months roll by the crimson grief turns to black and eventually to misty grey and like the mist it finally clears leaving only good memories of clear and beautiful white and blue ice shapes.

The following extract was written in 2003 and it illustrates the feelings of someone who has been there many times before. The new-

comers are fortunate. They know nothing and fear nothing.....

The wind was starting to moan as it blew over the hummocked sea-ice at twenty knots. We could not set the sails because the leads between the floes were narrow and as confused in direction as the maze at Hampton Court.

As we tried to move north we were consistently pushed east by long walls of impenetrable ice. In the end it was the ice which decided our path. We were sailing from the Great Koldewey Island on the east coast of Greenland to Longyearbyen in Svalbard – a distance of four hundred and eighty-eight nautical miles.

There was a lot of ice about and the fog enveloped us in minutes. We were motoring blind at very low speeds and we tried to look for leads on the radar. Much of the ice was no more than a foot or two above the surface so that no clear picture emerged on the radar screen. We found a small pool and pulled in. We put the anchor out on the ice floe. It was 02.15 and we walked a little distance over the ice to see if we could find a useful lead. There were none. There were, however, polar bear paw prints in the snow so I kept the rifle close by. The air was freezing and the rigging on the boat was soon covered with ice as the damp fog swirled around us.

We were stopped for two hours when Nico noticed that our small pool was getting smaller. He also noticed that the lead which we had come through, to get into the pool, was closing. Rob was optimistically fishing with rod and line in four thousand feet and it took him a little time to reel in his hooks. When he came onboard he was fishless. We moved away cautiously and kept the engine running slowly in order to keep the boat in open water. Visibility was no more than fifty feet and there was no opportunity to make any real progress.

By 13.00 on Tuesday the 5th August we were stopped and unable to move. The air temperature was -8°C and the fog was dense, damp and freezing. We had hoped that the afternoon sun might burn off the fog, but that was not to be.

A lead opened two hours later and we followed it, zig-zag, for three and a half hours covering an astonishing 1.5 nautical miles. Every hundredth of a minute was a joy and every minute of a degree was a miracle. We dared not think in terms of whole degrees, and we were not even particularly fussy if our miserable progress crossed longitudes or went up or down latitudes. Any progress felt better than standing still. At 00.45 on the 6th August we stopped again in a small pool. Our entry lead had closed and there was no way out. Nico went aloft and confirmed the worst. This was a black situation. There was an unspoken anxiety and, when I was asked questions as to what we should do, I could offer no solutions. More questions followed and I had no answers other than to say:-

"Wait and see".

I checked my insurance certificate to see if it was still in date and tried to remember ice lessons which I had learned in previous years but nothing occurred to me. I consoled myself by recalling the words of Alfonso, King of Castille:-

"If I had been around at the time of the creation, I would have made some useful suggestions for the better arrangement of things".

And then I wondered if life might have been better if I had taken up horse-riding or perhaps flying aeroplanes, as a young fellow. Although I never contemplated disaster during this summer's ice experiences, the fact is that we were lucky to get out of the ice, eventually, without loosing the boat. The other side of stubbornness is stupidity and between one thing and another, I am afflicted with generous helpings of both. It may not be sensible to allow yourself to get caught in sea ice but, in spite of fear and tribulation, there is a rewarding side to it. The might, strength and energy of massive ice floes are inspirational and at once highlight the insignificance of a few struggling humans passing through an environment created by God without human intervention. Our daily lives surround us with buildings, highways, conduits, tilled fields and nitrate grass which is much greener than nature's product. There is a spiritual magnificence about ocean ice, which has been fashioned by nature without man's intervention. In places, it is piled up to forty feet above sea level, the result of some great battle between two giant ice floes which went to war many years ago when they collided as they fought for the best seat in the house. This hummocked ice can, at times, look like a mad man's carving. There is a crazy and violent disorder about it which is both beautiful and threatening. By far the best moment of sailing in ice is the moment when you get out of it. In an instant, the anxiety is gone and you are left with golden dreams and memories of the low arctic sun illuminating ice pools at midnight.

Photos: © John Gore-Grimes

Hacking away the ice using heavy sharpened ice picks, trying to create an opening.

The *Arctic Fern's* journey into the Arctic Circle.

We moved on at 04.30. Karen did the best possible job, seated on the cross-trees, for three hours and ten minutes, but the truth was that we had nowhere to go and she recognised that. At 07.40 we were stopped completely. There was ice forming on the surface of a pool in which we found ourselves. The air temperature dropped to -14°C. We made two attempts to break out but, on each occasion, in spite of a huge team effort on the part of everybody, we got nowhere.

I had been up for long hours and found it difficult to put my head down. When I tried, I was up again in minutes to see if any change had occurred. It is extraordinary how sleepless hours, in these conditions, do not translate into fatigue. That comes later but, in ice, the cold air, the subconscious effort to keep any hint of alarm well disguised and the constant pressing anxiety, all combine to overcome tiredness.

I rang the Norwegian Met Office in Tromso and spoke to the ice officer, Signe. Although the news which she gave us was not encouraging, her sing-song accent was immensely cheering:-

"You are very very unlucky. I can see your position on the satellite. No! No! I cannot see your boat but you are in a small area of thick concentrated ice and you should try and move to the south east which will give you the best possibility of getting out into open drift ice."

I asked how big the 'thick concentrated ice' was and she replied:-

"Oh, about fifty square kilometres. It will break up you know!"

I asked if that would be in 2003 or 2004 and she replied:-

"I could not really say when."

I told Signe that the surface water, in our pool, was frozen and she seemed surprised about that. At 16.00 on Wednesday the 6th August we attempted to escape from our exclusive ice pool. We failed and we tried again at 18.00 but that failed also. At 19.10 Adrienne spotted an open lead and directed us through. We went from one pool to the next but at 19.50 we were stopped again. At 20.45 Karen spotted another lead. It looked narrow but my humour had disimproved. I placed the bow into the opening of the lead and Nico and Rob jumped onto the ice with heavy sharpened ice picks. They hacked away the ice which held us. I put the revs up to three thousand five hundred and Nico and Rob pulled the bow to port as they stood on the ice heaving a rope which was attached to the anchor winch. Arctic Fern complained. It was a terrible noise. It was a noise which no owner would like his insurers to hear.

All of this effort was rewarded and the boat charged ahead once it was released from the firm grip of the ice. Nico, in particular, had worked like a demon, hacking through the thick ice, to widen the lead. We were elated and it must be said that we did work hard as a team to push, shove, hack and drive Arctic Fern forwards, mainly to the south east, until eventually at 05.05 on Thursday morning the 7th August, we found ourselves in open water with one tenth ice and occasional patches of two tenths. We threw the C.Q.R. anchor onto an ice-floe. We took some corks out of wine bottles and turned up the music. We were 76° 21' 11" N, 9° 22' 79" W. It was flat calm and the arctic sunlight danced on the water's surface sometimes colliding with chunks of drift ice which passed by. We danced like the dervish. We played cards and all the losers had to go for a swim among the bergy bits. It was a shivering, shrivelling experience for the men. Karen just shivered. The water temperature was plus 2.2°C. Pilot Roche, although a consistent looser at cards, did not swim on this occasion.

We pulled up the anchor from the ice floe at 14.30. I think we had some sleep but, for how long, I cannot say. It was a beautiful arctic day and we moved south, as advised by the Met Office in Tromso. All went well with the mainsail providing the power until 21.30 when we were suddenly surrounded by ice again. The sail came down and we started the engine. We experienced some very slow and trying navigation until midnight. By that time there was an ice barrier, varying in width between two cables and, in a few places, two tenths of a cable (*cable=608 ft.*). On the other side of the barrier was open sea. We were in calm waters but just to the east of us we could see the waves of the Greenland Sea crashing against the ice barrier and sending spray high up into the air. The sun was low and the wind-chill fairly stung the skin on our faces.

On this cold morning, just after midnight, on the 8th August, I did not have to ask for volunteers. Pilot Roche had her bottom in the bosun's chair and Nico and Rob hauled her aloft. She stayed up there for an hour and fifteen minutes in a freezing northerly wind, without complaint and gave excellent hand directions as we moved along the wall of ice searching for an exit. I was driving and Rob verbally passed on Pilot Roche's hand signals. She found a way out. A place where the Greenland sea had breached the barrier. We took her down in case we bumped her off the mast. A collision with the ice was inevitable if we were to get out. Pilot Roche was a cruel shade of purple. She had identified a narrow twisting gap which was about two hundred yards in length with a lose piece of ice in the middle of it. The gap was no more than four feet wide and Arctic Fern has a beam which is just in excess of twelve feet. I pointed the bow into the opening and throttled up to three thousand five hundred. Nico and Rob shoved the ice with the poles and once the passage was wide enough, we literally shot out into the open sea. An involuntary cheer went up. We were in the sea with real waves to rock the boat and no more ice to trouble us. It was a tremendous feeling. The measured distance, as the crow flies, from the point where we had first entered the ice, to the exit point, was one hundred and thirty two n.m. The G.P.S. distance over the ground was an astounding two hundred and thirty eight nautical miles. As we pulled away from the ice, I said what I had often said before:-

"I will never go back to the ice again!"

John Gore-Grimes, Cavendish House, Smithfield, Dublin 7.

Highlights from An Bord Pleanála's Annual Report

An Bord Pleanála (The Planning Board) published its annual report for 2002 during the autumn. We give some of the main features from the Chairperson Mr. John O'Connor's Statement:

THE total number of cases determined by the Board in 2002 reached almost 5,900 and was, by a significant margin, the highest output every achieved by the Board, representing a 15% increase on the 2001 output which was itself a record. The increased output was due to the package of special measures introduced by the Board to clear the backlog, which were detailed in the 2001 Report, backed up by a sustained exceptional effort by Board members and staff. The intake of cases in 2002 showed a decline of 16% reflecting the downturn in economic growth and also the disruption in the planning system arising from the changeover to the 2000 Act, affecting applications made after 11th March 2002. The combined effect of the increase in output and the decline in intake resulted in the large backlog of cases on hand being eliminated by the end of the year with the result that the percentage of cases determined within the 18 week statutory objective period increased steadily during the year, from 26% in January to 61% by December 2002.

In 2003 to date, the rate of intake of cases is running a par with last year and the number of cases on hand has stabilised at a level commensurate with achieving the Board's strategic target of determining 90% of cases within the statutory objective period. In the month of May the figure was 79% and the average time taken to dispose of cases was 15.8 weeks.

The following are some noteworthy features to emerge in 2002:

- The percentage of local authority decisions reversed on appeal increased from 29% in 2001 to 33% in 2002. This appears to be almost entirely due to the increase from 14% to 20% in the success rate of appeals against refusals which, in turn, may be accounted for by a tendency on the part of the Board to give greater weight to national policies, as opposed to local considerations.
- The percentage of appeals in which the Inspector's recommendation was reversed by the Board, at 11%, was generally in line with the historical pattern, which must be regarded as satisfactory considering the high number of reports produced by external consultants of various categories (as opposed to Board staff) in 2002.
- There was a significant drop in the number of large (30+) housing schemes to come on appeal in 2002 (235 in 2002 compared to 392 in 2001). This may be due to the introduction of Part V of the 2000 Act relating to social and affordable housing which appears to have artificially brought forward planning applications in 2001 and led to uncertainties surrounding the operation of these provisions in 2002, as well as the general disruption caused by the changeover to the new legislation. The current year is showing an increase in the number of these housing schemes coming before the Board over 2002.
- The Board decided to carry out detailed surveys of its decisions in relation to three significant development categories that come on appeal i.e. rural housing, windfarms and telecommunications masts. Very briefly these show:
  - A relatively high rate of reversal of local authority decisions to grant permission for one-off houses in rural areas, with reasons relating to public health/pollution risk, traffic hazard, visual amenity and local development plan provisions figuring prominently.
  - A relatively high rate of reversal of local authority decisions to refuse permission in the case of both windfarms and telecommunications masts for reasons relating to national policies in relation to these categories of infrastructure.
- The requirement in the 2000 Act for third parties to have made a submission to the local planning authority at application stage in order to establish a right of appeal has resulted in somewhat of a fall in the share of appeals made by third parties, but it has also resulted in a quite substantial rise in the number of invalid appeals (19% of third party appeals are being invalidated for lack of evidence of having made a submission to the planning authority).

The Chairman reiterated the Board's three core principles of independence, impartiality and openness which are embedded in the Board's Mission Statement and objectives and underpinned by legislation. They are of particular importance in terms of retaining the confidence of the public, particularly in the context of adjudicating the major development projects which are determined by the Board. Public confidence depends on the integrity and quality of the Board's decision making and the professionalism with which they carry out their functions.

There are stringent obligations on members and employees of the Board to declare interests and a new code of conduct for all Board Members, staff and consultants has been adopted in accordance with the requirements of the 2000 Act.

An Bord Pleanála, 64 Marlborough Street, Dublin 1, Ireland. www.pleanala.ie

Two Sides to Every Flatfish

By Declan T. Quigley

MORE than 600 species of flatfish (Order: Pleuronectiformes) have been described. The group has been remarkably successful in colonising a wide range of habitats, from Arctic seas to the tropics, and from shallow estuarine waters (including freshwater) down to considerable ocean depths (≥1830m). However, they appear to be absent from the deeper abyssal and hadal zones.

Only 22 species of flatfish have been recorded from Irish waters (Table 1). The Irish group includes several species which are exploited by both the sea fishing industry (10) and anglers (8) e.g. megrim, turbot, brill, witch, halibut, dab, lemon sole, flounder, plaice and black sole. However, very little is known about the biology and distribution of the remaining (12) species in Irish waters. Indeed, most of them are considered rare or uncommon, probably because they have (as yet) no commercial or recreational value.

In most respects the early pelagic larvae of flatfish are similar to those of symmetrical fishes. However, during metamorphosis in the later stages of larval life the typical asymmetry becomes obvious. The eye on one side of the larva migrates over the head and comes to rest close to its opposite number. At this stage the pelagic life ceases and the young fish assume a primarily bottom-living (benthic) existence.

The most noticeable feature of adult flatfishes is the asymmetry of the head, in which, depending on the species, both eyes are sited on either the left (sinistral = left-sided) or right (dextral = right-sided) side of the body. The side on which the eyes are placed (ocular side) is usually coloured, while the opposite side (blind side) is usually unpigmented.

In general, the percentage of congenital abnormalities occurring in fish is considered to be highest among the Pleuronectiformes, possibly due to the complex morphological changes which occur during larval metamorphosis. However, it should be noted that several other factors can give rise to abnormalities e.g. disease, nutritional deficiencies, injury and pollution.

Some species of flatfish appear to exhibit a greater frequency of abnormalities than others (Table 2). However, this may only be a reflection of recording effort. All of the species exhibiting abnormalities in Irish waters were commercially important and therefore the chances of abnormalities being observed are greater in these species. It seems reasonable to assume that abnormalities would also be discovered in non-commercial species if greater numbers were examined. Some international studies have found that the frequency of abnormalities in specific species varied geographically and this has sometimes been linked to variations in water quality due to pollution. However, it may also be simply a reflection of recording effort. For example, more than 75% of the Irish records were reported from Co Kerry where recording effort is known to have been consistently high since the early 1960's. Indeed, the first recorded abnormalities were reported from this area as far back as 1850. The remaining records came from Co's Waterford (1); Wexford (3); Dublin (2) and Antrim (1). It is clear that there have been no records of abnormalities from a significant area of Irish coastal waters.

Albinism, which appears to be relatively uncommon, is usually incomplete (partial albinism); part of the ocular side retaining its normal colour. The condition appears to occur most frequently in black sole (Figure 1) in Irish waters. Albinism, and particularly partial albinism (13.6%), has accounted for about 16% of all the anomalous flatfish known to have been recorded in Irish waters to date (44).

More commonly, the blind side (which is normally white or unpigmented) may be completely coloured or bear patches of colour. This abnormality, which is termed ambicolouration, is more common in some species than in others; it appears to occur more frequently in brill, turbot (Figure 2) and flounder (Figure 3) in Irish waters. In the turbot ambicolouration is usually accompanied by other abnormalities, the most noticeable being the development of a 'hook' or 'notch' at the origin of the dorsal fin, which does not join the head in the usual way. 'Notched' turbot were noted by naturalists during the l800's and some were of the opinion that they constituted a separate species: *Platessa melanogaster*. Ambicoloured turbot may also exhibit bony excrescences or nodules on both the ocular and blind side; these nodules are only found on the ocular side of normal turbot. Ambicolouration (50%), including partial ambicolouration (Figure 4), has accounted for nearly 60% of all the anomalous flatfish recorded in Irish waters to date.

Some specimens of flatfish have also been found lacking the characteristic spotting pattern for the species (e.g. red spots on the ocular side of plaice); while other specimens have exhibited spots which are normally absent on these species e.g. brill (Figure 5). The condition where spots were either present or absent, has accounted for 13.6% of all the anomalous flatfish recorded in Irish waters to date.

Finally, an even more interesting abnormality is the phenomenon of reversal. Occasionally in flatfishes individuals occur with the eyes and colour on the side which is usually eyeless (blind side) and unpigmented. During metamorphosis the eye from the 'wrong' side of the head (for the species concerned) migrates and the fish ends up having both eyes on what would be the blind side in a normal fish. In sinistral forms, the right eye migrates to the left side; in dextral forms, the left eye migrates to the right side. Colouration follows the position of the eyes with the result that the fish is the 'wrong way around'. This phenomenon is very difficult to notice unless normal specimens are available for comparison. Reversal is more common in some species than others; studies have shown it to be extremely rare in dabs and four-spot megrim. It has only been recorded in megrim (Figure 6), flounder (Figure 7) and black sole in Irish waters, representing 13.6% of all abnormalities.

Photos: © Declan Quigley

Figure 1: Partial albinism in Black Sole (ocular side)

Figure 2: Ambicoloured Turbot

Figure 3: Ambicoloured flounder, blind side above and ocular side below

Figure 4: Partially ambicoloured turbot, blind side above and ocular side below

Figure 5: Brill with unusual black spots on ventral side

Figure 6: Reversed Megrim

Figure 7: Reversed Flounder (above) and normal (below)

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Left-Eyed Flatfish (Sinistral)	Species	Habitat	Distribution	*ISFC Record Weight	**BRFC Record Weight	***Catch Figures (2001) Live Weight	Value €
Scophthalmidae				(kg)	(kg)	(tonnes)	(x 1000)
Megrim	*Lepidorhombus wiffiagonis* (Walbaum, 1792)	offshore waters	common	1.850	1.715	3705	8783
Four-spot Megrim	*L. boscii* (Risso, 1810)	deep water	?				
Norwegian Topknot	*Phrynorhombus norvegicus* (Gunther, 1862)	inshore-offshore	rare ?				
Eckstrom's Topknot	*P. regius* (Bonnaterre, 1788)	offshore waters	moderately common ?				
Turbot	*Scophthalmus maximus* (L.)	inshore	common	15.436	15.308	186	1724
Brill	*S. rhombus* (L.)	inshore	common	4.313	7.257	96	712
Topknot	*Zeugopterus punctatus* (Bloch, 1787)	inshore	uncommon/local ?		0.382		
Bothidae							
Imperial Scaldfish	*Arnoglossus imperialis* (Rafinesque, 1810)	inshore/offshore	scarce ?				
Scaldfish	*A. laterna* (Walbaum, 1782)	inshore	common ?				
Thor's Scaldfish	*A. thori* Kyle, 1913	inshore	rare ?				
Right-Eyed Flatfish (Dextral)							
Pleuronectidae							
Witch	*Glyptocephalus cynoglossus* (L.)	moderately deep water	common		0.533	865	1469
Long Rough Dab	*Hippoglossoides platessoides* (Fabricus, 1780)	moderately deep water	common		0.155		
Halibut	*Hippoglossus hippoglossus* (L.)	deep water	uncommon	70.824	106.136		
Dab	*Limanda limanda* (L.)	inshore	common	1.064	1.254		
Lemon Sole	*Microstomus kitt* (Walbaum, 1792)	inshore/offshore	locally common			443	1070
Flounder	*Pleuronectes flesus* L.	inshore	common	2.229	2.593		
Plaice	*P. platessa* L.	inshore	common	3.736	4.635	824	2074
Greenland Halibut	*Reinhardtius hippoglossoides* (Walbaum, 1792)	deep water	rare				
Soleidae							
Solenette	*Buglossidium luteum* (Risso, 1810)	inshore/offshore	common				
Thickback Sole	*Microchirus variegatus* (Donovan, 1808)	offshore/deep water	rare ?				
Sand Sole	*Solea lascaris* (Risso, 1810)	inshore/offshore	rare ?				
Black Sole	*S. solea* (L.)	inshore	common	2.869	2.966	356	3678

*Data Sources: * Annual Report of the Irish Specimen Fish Committee (2002). ** British Record (Rod Caught) Fish Committee (1995-2003). *** Central Statistics Office: Fishery Statistics (2001)*

Table 1. Flatfish species in Irish waters, with notes on habitat, distribution, angling records and commercial catches

	Ambicolouration		Albinism		Spots		Reversal		Total	%
	Full	Partial	Full	Partial	Present	Absent	Sinistral	Dextral		
Megrim								3	3	6.8
Turbot	5	1		1					7	15.9
Brill	9				1				10	22.7
Dab	1								1	2.3
Lemon Sole		1							1	2.3
Flounder	6			1			1		8	18.2
Plaice		1		1	1	4			7	15.9
Black Sole	1		1	3			2		7	15.9
Total	22	3	1	6	2	4	3	3	44	
%	50.0	6.8	2.3	13.6	4.5	9.1	6.8	6.8		

Table 2. Frequency of abnormalities in Irish flatfish species

Oleg Polunin and Sherkin Island

By John Akeroyd

PEOPLE often ask me why I visit Sherkin Island, and what led me there in the first place. My first visit was in 1986, but I was aware of the island some 20 years earlier. I was at school in Surrey, and my biology teacher Oleg Polunin had just introduced me to *Watsonia*, the journal of the Botanical Society of the British Isles, which lived in a mysterious cupboard at the back of the classroom. He was keen to encourage me, showing me a scientific paper he had published in 1950, "Notes and additions to the flora of the islands of S.W. Cork." I had always been interested in Ireland, but would not visit until 1979 when I took up a post-doctoral fellowship at Trinity College, Dublin. Strangely it took me a little longer to get to Sherkin!

So who was Oleg Polunin? His name suggests "Russia", and indeed father Vladimir was Russian, a forester turned artist who found refuge in Britain after the 1917 Revolution. With his English wife he designed sets for Diaghilev's famous Ballet Russe, and later he taught art at the Slade School. Oleg, who was born in 1914, grew up in the countryside near Reading. He read Botany at the University of Oxford and took up a post at Charterhouse School in 1938. Then the Second World War took him away for five years, much of the time spent in the Far East. He returned to Charterhouse in 1946.

Charterhouse was long in the forefront of biology teaching, especially the new science of ecology. The biologists always had a long excursion during school holidays, studying botany and marine life, and in the years after the Emergency they camped in West Cork, first near Lough Ine between Baltimore and Skibbereen, and later on across the sound on Sherkin. The Carthusians all came down, with tents and baggage, by train to Baltimore quay! Their campsite was at Trabawn, above the strand on land owned by the O'Driscoll family. This area remains rich in plants, and Cormac O'Driscoll's potato patch yielded many interesting fumitories and other weeds for our 1996 book on *The Wild Plants of Sherkin, Cape Clear and adjacent islands of West Cork*. In 1949 Oleg recorded the now very rare Corn-cockle (*Agrostemma githago*) here, the last record I have traced for the islands.

In the summers of 1948 to 1951 Oleg seems to have worked tirelessly on Sherkin, and Cape Clear, helping the boys with their studies and travelling extensively among the islands of Roaringwater Bay. He recorded common and rare plants and vegetation, and with the help of a senior biologist, Palmer Newbould (later Professor of Biology and Vice-chancellor at the University of Ulster), even embarked on a detailed report on the islands. Other work – and Palmer being called off for National Service – intervened and the project was not finished, but the notes that Oleg left behind were invaluable for our own Flora compilation. However, these Sherkin interludes played a more significant role in his subsequent career – for they launched him fully on to the botanical stage.

In 1948 Oleg was checking specimens from Sherkin at the Natural History Museum in London. His work came to the attention of the then Keeper of Botany, Sir George Taylor, who arranged for this young botanist to join an expedition to the Himalayas. This would set Oleg off on serious plant hunting and plant photography, activities that would form the basis of his influential series of illustrated Field Guides on European and Himalayan flowers. He travelled widely in the 1950s and 60s, and the first of his field guides, *Flowers of the Mediterranean* (with the late Anthony Huxley) appeared in 1965, about the time I arrived at Charterhouse. I won it as a School Prize for Botany in 1966! The plates seem crude now, but they were state-of-the art in those days and spawned a host of imitations.

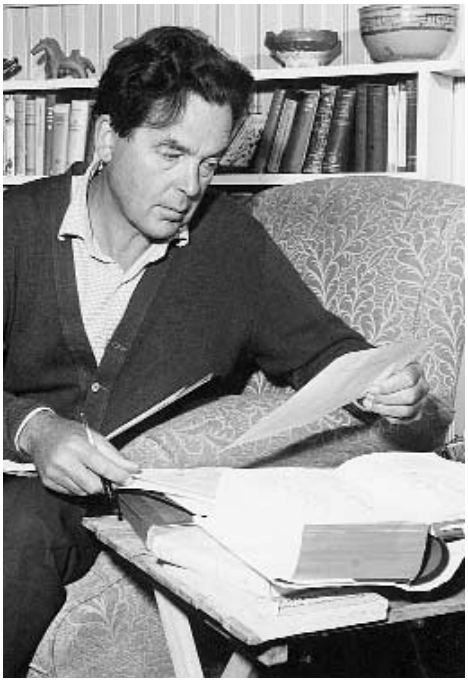
Oleg remained a friend and influence long after school. He was one of the most remarkable people I have met, an enthusiastic teacher who did so much to tell ordinary people about Europe's precious flora. A big man of great presence and with a genius for friendship, incredibly handsome and always with a slow kind smile, he was a conservationist before, to borrow a phrase from the immortal Flann O'Brien, "it was popular or profitable" so to be. He kept telling me to go to West Cork, but ironically I did not make it there until a year after his untimely death in 1985, from motor-neurone disease. I came back the following year, with Professor David Webb of Trinity College, who had gone to Charterhouse some 40 years before I did: we even had had the same zoology teacher, Percy Chapman, who gave us both an interest in marine biology. Matt Murphy brought me back in 1990 and I have returned almost every year since. Studying the flora has been a labour of love, for it has enabled me to complete the last fragment of Oleg Polunin's substantial contribution to botany. It is curious to reflect that I am now the age he was when we first met at Charterhouse!

John Akeroyd edited "The Wild Plants of Sherkin, Cape Clear and adjacent islands of West Cork" (1996), and still finds interesting new plants for Sherkin and the other islands in southwest Ireland.

As his biology teacher, Oleg Polunin was to first introduced John Akeroyd to Sherkin Island in the 1960s. Years later this was to lead to John completing the last fragment of Oleg Polunin's substantial contribution to botany.

Photo: © Dipsacus Pedata Mould

In the summers of 1948 to 1951 Oleg Polunin worked tirelessly on Sherkin Island (above) and Cape Clear, recording common and rare plants and vegetation. This work was to help launch him onto the botanical stage.



Photos: © Mrs. L. Polunin

An expedition to the Himalayas set Oleg Polunin off on serious plant hunting and plant photography and these activities would form the basis of his influential series of illustrated Field Guides on European and Himalayan flowers.

Litter and the Law

Know your responsibilities for taking action against litter

Laying Down The Law

The Litter Pollution Act, 1997 brought in tougher litter laws to combat the problems of litter pollution more effectively.

This leaflet is intended as a practical guide to these litter laws. For further information you should contact your local authority or obtain a copy of the Litter Pollution Act (No.12 of 1997) from the Government Publications Office, 4/5 Harcourt Road, Dublin 2.Tel.: 01-647 6000

Fines

Leaving or throwing litter in a public place or in any place that is visible from a public place is an offence. This includes creating litter in the carrying on of a business, trade or activity or in loading, transporting or handling anything.

Offenders can be subject to an on-the-spot fine of €125 or a maximum fine of €3,000 in court.

The definition of litter is quite wide and extends beyond casual pieces of paper or cigarette ends to anything large or small which is, or is likely to become, unsightly.

A person convicted of a litter offence may also be required by the court to pay the local authority's costs and expenses in investigating the offence and bringing the prosecution.

Public Places

If you are the owner or the person responsible for a place to which the public has access you are obliged to keep the place litter free, regardless of how the litter got there. This applies to any public place which may include the precincts of a shopping centre, a school campus, a public park, a train or bus station.

Property Owners / Occupiers

The owner or occupier of property, which can be seen from a public place, is obliged to keep it free of litter. Basically, any outdoor area on your property that is visible from a public place must be kept free of litter.

In addition, if you occupy land/premises along a public road in a built up area, you are required to keep the footpaths, pavements or grass verges in front of your property free of litter.

Litter Black Spots

Where litter has accumulated on property for whatever reason and the litter is visible from a public place, the local authority can issue a notice to the owner or occupier requiring the prompt removal of the litter. Such a notice can also set down precautionary measures to be put in place to prevent a recurrence.

If a property owner or occupier fails or refuses to do everything that has been requested, the local authority has the power to do whatever is necessary itself and require the owner or occupier to pay all of the costs involved.

Local authorities can use similar powers to target mobile outlets, certain types of premises, major events and articles/advertisements on certain structures, to prevent and control litter.

Advertising Flyers

The placing of advertising leaflets on car windscreens is prohibited and if you are proposing to distribute advertising leaflets in the street, you should first check with the local authority to see if they have introduced any local litter restrictions, which they are entitled to do.

Presenting Your Refuse for Collection

Taking a few small precautions in the way you present your refuse for collection, whether household refuse, commercial or industrial waste, will help enormously in preventing the creation of litter. If you are not already using a wheelie-bin or ordinary refuse bin, you should use strong plastic bags and avoid using lightweight supermarket type bags. You should put out refuse for collection on the morning of the collection and not on the day or night before. The longer it is left out for collection the more likely it is to attract the unwanted attention of dogs, cats and birds.

It is an offence to dispose of your household refuse in street litter bins.

Who Enforces the Litter Laws?

Local authorities are responsible for implementing the litter laws in their own areas. This means they are responsible for the prevention and control of litter and they have the power to take enforcement action against individuals who break or ignore these laws. Gardai also have the power to issue on the spot fines for litter offences.

Illegal Dumping

The litter laws have increased the powers of local authorities to combat the problem of illegal dumping of refuse and rubbish. Where a local authority finds material that is illegally dumped and establishes the identity of the owner of the material, that person will have a case to answer without necessarily having to be caught in the act.

Extra powers are also available to local authorities to require a householder or business operator to indicate how and where they are disposing of their waste. This is particularly relevant if the householder or business owner is not availing of a refuse collection service or bringing their waste to an authorised disposal facility.

If you see someone dumping illegally, report the matter to your local authority who will investigate and take any necessary enforcement action.

Major Events

The promoters or organisers of major events are required to ensure that they have litter control measures in place at the venue and in the surrounding vicinity before, during and after the event. This applies to football matches and other social and sporting events at which large crowds attend. It is possible that this task can be undertaken by the local authority but the promoter / organiser must bear the costs involved.

Mobile Food Outlets

Operators of mobile food outlets selling fast food or beverages, or other outlets such as those selling farm produce are obliged to provide suitable litter bins in the vicinity of their outlets. Also, they must clean up any litter arising from the operation of their outlets within a radius of 100 metres from their outlet.

Dog Fouling

Dog owners must now remove their pets' waste from public places and dispose of it in a proper manner. This obligation applies to the following places:

- public roads and footpaths
- areas around shopping centres
- school/sports grounds
- beaches
- the immediate area surrounding another person's house

Guide dogs and working dogs (handling livestock, Garda and Custom and Excise dogs)are exempt.

Posters and Signs

The law forbids the putting up of posters/signs on poles or on other structures in public places unless you have the written permission of the owner of the pole or other structure in advance of putting up the posters/signs.

Local Authority Duties: Litter Management Plans

Each local authority is obliged to prepare a litter management plan for its own area. This plan sets out their objectives to prevent and control litter as well as measures to encourage public awareness. The plan must also set out the measures and arrangements by which they intend to achieve their objectives. In preparing a litter management plan the local authority is obliged to consult with local community and voluntary interests before a plan is adopted by the Council members.

Litter Control

They are responsible for keeping public places under their control, including public roads, clear of litter as far as is practicably possible. This includes the arrangement of cleansing programmes and the provision and emptying of litter bins.

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Do Plants Make Good Mothers?

By Rosie Solbé

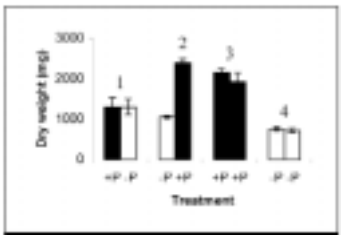
STRAWBERRY, Creeping buttercup, Couch grass, Creeping Bent grass. Gardeners will recognise these – some are useful, some a real nuisance, some neither one thing nor the other. If these plants are growing in a good place with the right amount of water, light and minerals they don't wait to set seed, they produce offshoots to exploit the resources. These plants build up a colony of daughter plants without the need for flowering. We call this 'vegetative reproduction'; the daughters are all genetically identical to their mother so these are called clonal plants. We assume that until they are established, these daughter plants will be supplied by their mother. So we can ask "Do plants make good mothers?"

How does a colony form? Think of a strawberry plant. It pushes out runners along the ground and develops offspring at every 'node', that is, at the base of every leaf, so the stem linking the parent and the daughters is a stem of the parent plant. Water and minerals such as nitrogen and phosphate move from the soil in the xylem upwards from the root through the stem to all parts of a plant. Food may travel in either direction in the phloem, mainly from the shoot to the root from photosynthesis in the leaves but also from a storage root like a carrot or parsnip, to the shoot. A horizontal stem therefore could have food moving in either direction but should have water and minerals moving only from mother to daughter.

A grass plant needs about 1/200th of its weight in phosphate if it is to grow properly. Plants without enough phosphate weighed about 1/4 the weight of plants given enough phosphate. But does a mother grass plant share phosphate with her daughter?

Four mother plants, each linked to her own daughter, had their roots in one concentration and the daughters had their roots in another. High phosphate is called +P and low phosphate is called -P so the four pairs of mothers and daughters were arranged:-

Pair	Mother	Daughter
1	High phosphate (+P)	Low phosphate (-P)
2	Low phosphate (-P)	High phosphate (+P)
3	High phosphate (+P)	High phosphate (+P)
4	Low phosphate (-P)	Low phosphate (-P)



The graph shows the weight of pairs of mother and daughter plants attached to each other - the mother on the left the daughter on the right. If the plant is given high phosphate the bar is coloured black and low phosphate is shown as white.

Notice in the numbered pairs in the graph how the daughter is doing best of all in pair No 2 – so perhaps it is attached to a "good mother" and some plants do make good mothers

1. well-fed mother shares P so she and her daughter are the same size
2. deprived mother has an enormous, well fed daughter
3. both do well
4. neither does well

We'd expect that water would go from the mother's roots into the stem and so into the daughter but in fact if the roots of mothers and daughters are put in different dyes some of the water can be seen to be flowing in the "wrong" direction, with the mother taking a little water from the daughter and giving most back But just because the mother is taking water is she also taking dissolved phosphate? To find out, we have to feed her roots with water containing radioactive phosphate and find where the radioactivity ends up. This shows that a mother plant given high phosphate allows some phosphate to the daughter, but remember that the poor deprived mother in pair 2 had an enormous daughter – now we see why - the well fed daughter is strong enough not only to take up her own phosphate through her roots but also to grab the mother's phosphate. The poorly fed daughter in pair 1 had some phosphate given her by her mother – but it's rather harder for the phosphate to go the "wrong way" so a poorly fed mother attached to a well fed daughter suffers.

So much for water and minerals – but they're not food. Do plants make good mothers when it comes to sharing food? Plants trap the energy of sunlight in their green chlorophyll and use the light energy to combine water and carbon dioxide into sugar. To look at this we again use radioactivity – this time growing the plant in an atmosphere of radioactive carbon dioxide gas. We let the mother plant use this and in daylight the radioactive carbon is built into the sugar and we can track where that radioactive sugar goes. And we see that the mother isn't giving a thing away – all the sugar she makes she keeps in her own shoots and roots!

Well, do plants make good mothers?

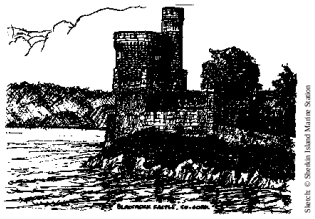
All we can say is that plants try very hard to produce large families! Either they produce seeds which disperse and produce more of their kind or they short-circuit the system and produce identical daughter plants. In order that valuable resources are not wasted it seems that a well fed plant will make certain that it can grow well and produce offspring – either by making clones or by making flowers then seeds. Thus a well fed plant, growing in fertile soil, will have the strength to grab what it can – from the soil, from its parent or even from its own daughter.

So sorry! Plants don't make very unselfish mothers but they do their level best to ensure the survival and success of their kind and if they happen to have a sickly offspring then it's rather hard luck on that offspring - mother will not go out of her way to help but will use the daughter to help provide her with the resources she needs in order to reproduce – and that's really the advantage of this method of reproducing by creating a clone. The plant can take advantage of every possibility of ensuring its survival, and thus the survival of the species.

Dr. Rosie Solbé, St Asaph, Denbighshire, UK.

Development & Heritage Protection

A Balanced Approach



Sketch: © Sheelan Island Marine Station

By Joe Gavin

Development Growth

IT would be true to say that the opportunities which the architectural and planning professions have today to shape the future built fabric of our country have seldom been greater.

Ireland is experiencing unprecedented levels of growth in the construction industry. In the residential area alone there is a demand for 60,000 new homes to be provided each year for the next 10 years. There is also a heavy demand for office and retail development. Side by side with these demands there is emerging a greater emphasis on sustainable development and the protection of our natural heritage.

We have seen recommendations in the Bacon Report for higher residential densities which have been taken on board by the government and by local authorities. Good design and layout are essential requirements to be addressed if higher density housing is to be sustainable and to provide a comfortable style of living for our citizens. In moving away from the 6 to 8 housing units per acre on green field suburban development to perhaps twice this level, good creative design is important. In urban development housing units of 70 to 100 per acre have been achieved and, based on good design, have been found to suit housing needs and lifestyles of many of our citizens.

Heritage – Public Buildings

It is important that while we address the needs of new development that we have due respect for our existing built heritage. Some of Ireland's finest public buildings were built in the middle of the 19th century. Most of our universities date from that time as do the courthouse buildings which grace many of our towns.

Sadly many of these fine courthouses were neglected and allowed to deteriorate until recent times. There is now a greater appreciation of their quality as public buildings and many of them are the subject of considerable refurbishment investment including our own courthouse here at Washington Street, Cork City.

Balance

In weighing up the options of permitting new developments, of changing older buildings or of permitting the demolition of existing buildings we must seek to achieve a reasonable balance. Not all old buildings are worthy of retention. We must have room to allow our current day architects to make their own mark and to leave future generations buildings which they will regard as part of their important heritage.

In the area of architecture and town planning, the ancient Romans laid down 3 principles – Solidity, Beauty and Utility. These principles are as important today as they were when Rome was built. With regard to the principle of Utility or Functionality it is necessary that older buildings remain functional in modern times. Their original function may have changed and if they are to survive we have to allow change. Good examples of these are the fine mills and warehouses which were built in the 19th century. There is no longer a use for them as mills or warehouses. Their floor to ceiling heights may be too low or too high for modern uses. We must be prepared to allow alterations in these areas to facilitate modern architecture if we are to secure the survival of many of these fine buildings.

Demolition will also be appropriate in particular situations. When we visit St. Finbarre's Cathedral in our own city we admire the creativity, skill and vision of the architect and all those who put such a magnificent structure in place in the 1860's. We do not criticise the fact that several other church buildings which existed on the same site dating back to 600 A.D. had been removed from time to time. In this whole area there must be scope for balance and reasonableness.

Legal Protection of Heritage

The Planning and Development 2002 Act introduced new legal requirements designed to protect architectural heritage. It has provision for dealing with Protected Structures, Architectural Conservation Areas and areas of Special Planning Control.

Local Authority Development Plans have implications far beyond control and protection of buildings and structures. The Development Plans can have an impact on the whole range of elements which make up our national heritage as defined in the Heritage Act 1995 as including:

- Monuments
- Archaeological Objects
- Heritage Objects
- Architectural Heritage
- Flora & Fauna
- Landscapes
- Seascapes
- Geology
- Heritage Gardens & Parks
- Inland Waterways

Wildlife Habitats

It is important therefore that in preparing Development Plans due regard is had to potential impacts on our national heritage in all of its aspects. Policies in Development Plans can, for example, have implications for the protection of the Irish Language.

Questions were recently raised in a particular case where a local authority was allowing substantial residential development in an "Irish Speaking" village as to whether the occupants of the houses, if not fluent in the Irish Language, could have a detrimental effect on the local language culture. A linguistic impact assessment was called for.

This was somewhat unusual but it is indicative of the influence which policies in the Development Plan can have on such a wide range of issues.

It is important in framing Development Plans that proper regard is had to design, heritage and sustainability issues. Towards this end, a partnership approach with input from the public and the various relevant agencies such as the Heritage Council, The Office of Public Works, Department of Arts, Sport and Tourism, An Taisce, R.I.A.I. (Royal Institute of the Architects of Ireland), I.P.I. (Irish Planning Institute), and other specialised groups should be encouraged.

The new format for public consultation in the preparation of Development Plans very much encourages and supports this holistic and participative approach. From such a partnership ethos the legal measures for the protection of our heritage contained in the Planning and Development Act 2002 would be underpinned with relevant development and development control policies in Development Plans.

Attitude and Approach to Heritage Protection

To many property owners and developers words like "heritage", "conservation" and "protected" are a cause for concern. In some cases it is right that it should be so but in other instances such concern results in inactivity which can be to the detriment of buildings with important heritage value. The cause of this concern has risen in part from a rigid, purist and dogmatic attitude on the part of some people in authority. They may reside in the Planning Authority, The Planning Appeals Board, Dúchas, An Taisce etc. It also rises in part from a lack of understanding and appreciation of how development may be allowed to proceed on protected structures and other restricted areas.

In my view best results can be achieved for all parties by having a consultative, partnership and practical approach. A working partnership between the property owner and the local planning authority is of critical importance. I would like here to refer to one recent example in Cork City of the handling of a proposed development on a protected building.

The property in question, a "protected structure", is located in the shadow of St. Finbarre's Cathedral and is known as "Carraigbarre". It is a dwelling dating back from the 1730's approximately. It was in an exceptionally poor state of repair and had a garden attached at the rear.

The owner approached the planning authority with a proposal for the restoration of the dwelling and for the construction of a number of residential units in the garden. It was his contention that he could only afford to restore the protected dwelling if new residential developments were permitted in the rear garden. The initial reaction of the planning authority was to refuse any building in the garden on the grounds that it would compromise the protected structure as the open garden was seen as an integral part of the structure. As a consequence of not allowing development in the garden the protected structure would not be restored and would continue to deteriorate.

Meetings were arranged and the planning authority decided to adopt a more accommodating approach. Following a series of consultations with active involvement of the planning authority's Conservation Officer, a new attitude was agreed. The end result was to grant planning permission to build a number of residential units in a section of the garden. With advice from the planning authority, the Conversation officer and the property owner's architect, an appropriate layout and design was followed which either eliminated or greatly reduced negative impact on the protected structure. The protected building has now been fully restored and the new residential units have been constructed. The entire area has been transformed for the better and the restored building is once again functioning as a dwelling with a long life ahead of it. The building is open to the public and well worth a visit to see how beneficial the reasonable and practical approach taken by the planning authority has been to the protection of this element of our heritage.

As planning authorities, heritage groups, professional or regulatory bodies we can, in my view, do much more for the protection of our heritage by adopting a consultative, informative and practical approach to issues rather than following a dogmatic, confrontational, purist or rigid line.

Financial Issues

While we now have comprehensive legislation in place for the protection of our heritage there are many financial implications which need to be addressed in the area of protected structures. If funds are not available to the owners of protected structures they will not be in a position to maintain or restore them. Some financial assistance is available in the form of tax incentives but much more is needed. Many of our finest heritage buildings are churches and in some areas with the fall in congregations there is not sufficient support to maintain these buildings into the future. One very good example, again in Cork, is St. Anne's at Shandon. This church houses the famous Shandon Bells in its steeple and is one of Cork's most famous landmarks. It is in need of extensive and urgent repair. Securing funds is a major difficulty.

Another local example of a protected structure under threat is Blackrock Castle – again an historic landmark in the Cork landscape. The Castle has been idle and in deterioration for a number of years. The owners put it on the market but because of its protected status and the extent of the expensive restoration which would have to be undertaken the interest was limited. Cork City Council recently acquired the Castle in order to ensure its protection. Its acquisition and restoration will put a severe strain on the local authority's finances.

It seems to me that funds are more readily available for our underground heritage, for ruins and artifacts more than they are for overground structures. Substantial state monies are expended on archaeological digs and on the recording of buried ruins. While they also have an importance it is critical to address overground structures which are endangered before they too become ruins.

Conclusion

Whether in the preparation and implementation of Development Plans, in the functioning of regulatory and advisory bodies, in the securing of funding or in the preparation of heritage policy, our national and built environment will be all the better for a partnership approach based on common sense by all the actors involved.

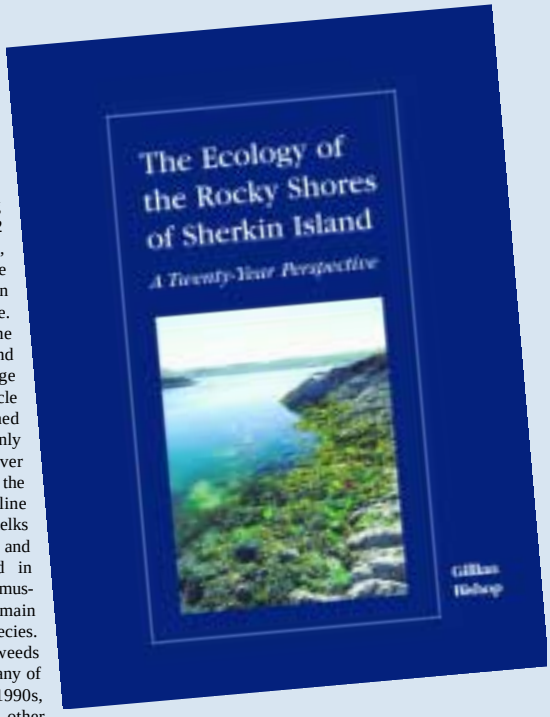
Joe Gavin, City Manager, Cork City Council, City Hall, Cork. www.corkcity.ie

The Ecology of the Rocky Shores of Sherkin Island

A Twenty-Year Perspective

Photo: © Susan Murphy Vickers

The book was launched by the world renowned rocky shore expert, Dr. Jenifer Baker (right), seen here with Gillian Bishop and her son Alexander, Robbie Murphy, Karen Mould, Anne Mansfield, Alistair Nieuwenhuyse and Claire Brown.



THIS October saw the launch of the milestone publication for Sherkin Island Marine Station. *The Ecology of the Rocky Shores of Sherkin Island - A Twenty-Year Perspective* is the first major analysis of rocky shore data from a programme begun in 1975 by the Station, and which still continues today. It draws together the work of at least 200 volunteer biologists.

The book gives well-illustrated background information on the common species of the rocky shore together with how the rocky shore food web functions. The main focus of the book though is seven shores on Sherkin Island where sampling has been carried out monthly between April and October. Faced with a huge database of hundreds of species, which are listed in the book, the analysis presented deals only with the few visually dominant animals and plants (up to 20 per shore) e.g. the large brown wracks, some common red and green seaweeds, barnacles, limpets, mussels, winkles and dogwhelks, which will be familiar to anyone with an interest in the seashore. The book was written specifically to include people and to appeal to a wider audience than the academic community.

The long period of recording has shown that many species have cycles of abundance, with the length of a single cycle varying from three to 12 years. Other species, such as limpets, are relatively constant in their population size. At the end of the 1980s a major and widespread change occurred - the barnacle populations crashed significantly and only started to recover towards the end of the 1990s. This decline affected the dogwhelks that feed on them and they also declined in numbers, as did the mussels - the other main dogwhelk food species. Large brown seaweeds also decreased at many of the sites in the 1990s, which amongst other things - removed the habitat of the flat periwinkle; hence it too declined in numbers.

Photo: © Daphne Perkins Mould

Species analysed at seven sites on Sherkin Island, over a 20-year period, form the basis of the book.

The long period of recording has shown that many species have cycles of abundance, with the length of a single cycle varying from three to 12 years

It is clear to us now, that had the work been written up after a much shorter period, five or ten years only, an entirely different interpretation would have been made. We still do not know the answer to the question - "What are the normal population levels on Sherkin's shores?" Was it those of the 1980s when the shore supported more biomass - or the less productive years of the 1990s? Will productivity increase again in the shore community?

The original aim of the survey was merely to document the rocky shore species over time, but analysis of the physical environmental factors recorded (sea temperature, air temperature, wind, rainfall, sunshine hours) has also been carried out. Of interest here is the fact that surface sea temperature has been slightly higher since 1987 than the early years of the survey 1981-1986.

Data always generate more questions and work at Sherkin Island Marine Station continues on what has now become a topic of national and international interest - how is climate change affecting our environment?

The Author

GILLIAN BISHOP lives with her family on a small mixed farm in Scotland near Aberdeen, and moves in and out of this relatively tranquil environment and the hectic one of an environmental consultant in the UK oil industry.

For 13 years Gillian has supported exploration drilling in sensitive marine environments. This mean researching and understanding all the environmental resources and sensitivities in an area where they plan to drill, writing oil spill contingency plans and discussing theses plans and operations with all the many interested parties - councils, natures conservation bodies, fisheries and of course the UK government. Over this time period, environmental legislation has increased and they now present formal environmental statements to summarise the proposed operation, issues and environmental impacts. Much of Gillian's work has centred on exploring the Atlantic Margin - the seas to the north and west of the UK - a fascinating area for the marine biologist.

Recently Gillian switched her allegiances to a gas production platform in the North Sea where gas, condensate and crude oil are produced and piped ashore, and more wells are continuously drilled into the reservoir. She manages the environmental programme for the platform, to ensure they are legally compliant and make constant efforts to minimise their environmental impact.

The best bits of the job for Gillian are without question, those that focus on the marine environment - seabed and seashore animals and plants - when the marine biologist in her can take over again!

Jenifer Baker's Launch Speech

WE are here to celebrate three things. First, the publication of *The Ecology of the Rocky Shores of Sherkin Island*, this unique book which has been more than twenty years a-growing. Second, the talents and dedication of Gillian Bishop in putting it all together and the skills of the many people who have contributed to the book. Third, the rocky shore programme itself, which is still going strong. So this book is a milestone rather than the last word, and perhaps in another twenty years Matt will be asking Gillian to write another book!

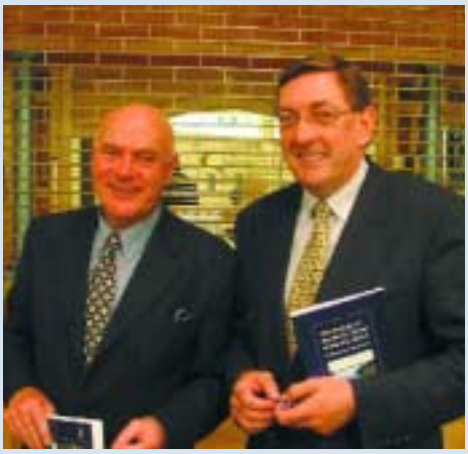
I've been around long enough to remember a time when there wasn't a rocky shore programme based at Sherkin Island Marine Station. That was way back in 1975, when I first had the pleasure and privilege of meeting Matt and Eileen and their family. Like Gillian, I had been working on oil spill studies in Bantry Bay and can remember Matt wanting to discuss rocky shore surveys. Of course, I didn't realise then that it would lead to one of the world's longest running and most extensive shore monitoring programmes. Yes, that's right – you have on your doorstep one of the world's longest running and most extensive shore monitoring programmes. It's only in retrospect I can appreciate the greatness of Matt and Eileen's vision. The publication of this book is a fruit of their vision and is a remarkable achievement in many ways.

It distills an enormous amount of work which has involved hundreds of people from many countries since 1975 – volunteer biologists, scientific advisors and practical helpers, backed by the long-term commitment and skills of the whole Murphy family. Do read the Acknowledgements section of the book, and read between the lines as well to appreciate the depth of so many people's commitment.

Can you imagine the amount of data behind this book? I've seen some of it at the Marine Station and it's certainly an impressive resource for researchers, but in its raw form it's not easily accessible to the public. What Gillian has done so successfully is to make the information accessible, in fulfilment of a general aim of the Marine Station to communicate to the public. Marine biology is for everyone, and there's something for everyone in this book. For researchers, it's a key to the Marine Station's data bank, but it's also useful for school and university students and teachers with an interest in marine fieldwork. And for any interested member of the public it's a way of exploring shore life and its dynamics more deeply.

Gillian can tell me afterwards if I'm right, but I suspect that during the preparation of this book there have been occasions when it has been difficult to see the wood for the trees, or, to change to a shore metaphor, the book for the barnacles. But both perspectives (we might call them the microscopic and the telescopic perspectives) are necessary, and she has used both. The great vision can't be fulfilled without all the detailed work, but the detailed work lacks purpose if there isn't a vision of the values of rocky shores.

One of the values, which clearly emerge from the book, is educational value. Rocky shores are superb for teaching ecological principles to school and university students. Apart from learning to identify the wealth of organisms, there's great scope for relating distribution of species to environmental variables, working through different zones up and down the shore or along the shore from wave-exposed to sheltered. The book gives plenty of information on these two dimensions, but outstandingly offers the third dimension of time. Studies need no longer be just snapshots but can be related to long-term trends and fluctuations. I wish all this had been available when we were running industrial courses at the Marine Station many years ago – Gillian will remember them – because one of the uses of long-term data is to help sort out the effects of human activity from natural changes. That's a topic, which is much discussed currently, with particular attention given to global warning concerns. From a rocky shore perspective, there's a classic example from the north of Scotland where a one-off survey would have suggested that an oil spill had severely depleted shore life. But there had been long-term monitoring and this showed that there had been a decline before the spill, attributed to severe winter weather many months previously. So things were more complicated than a single snapshot would suggest.



Rocky shore enthusiasts Michael O'Neill and Pat Maher at the launch.

Autographing copies at the book's launch.

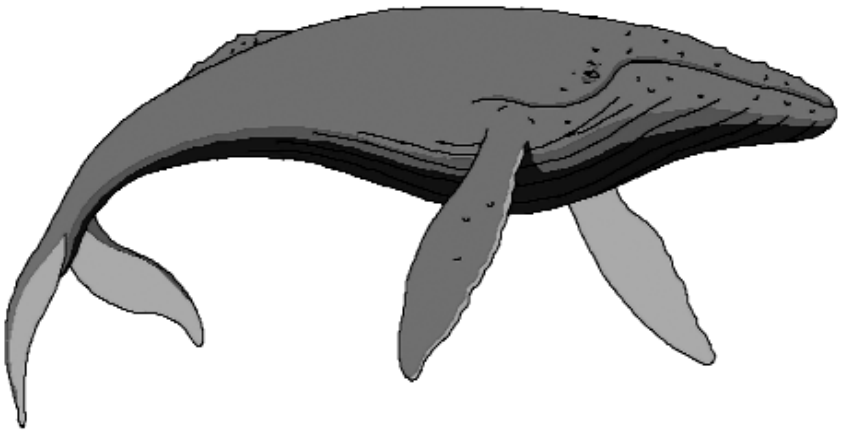
Matt Murphy, Sherkin Island Marine Station, with the author Dr. Gillian Bishop and her children: Hannah, Esther and Alexander.

As oil pollution has been my speciality, here are some more oily memories. Shores in Roaring Water Bay provided valuable uncontaminated reference sites when we were investigating the environmental effects of the terrible Betelgeuse accident in Bantry Bay. And then, in the 1980's, we did some grant-aided basic research on principles relevant to spill clean-up, using Sherkin Island shores. The choice was obvious – it was Sherkin Island that had the variety of shores, and it was Sherkin Island that had existing background information relevant to the research. So that's another value of having long-term monitoring – it helps other research projects and can indeed attract them.

And while we're thinking about values, working on Sherkin Island always seems to bring added values of having one's skills expanded in unexpected directions. I'm sure that's the common experience of Gillian, myself, and the many volunteers over the years. I have a memory of arriving on Sherkin one evening for a conference the following day, and finding the conference hall still under construction. I seem to remember floor tile laying most of the night with Saran Petpiroon, a research biologist from Thailand; and Professor and Mrs Knight-Jones from University College Swansea were installing a door. Where else could one combine rocky shore biology with enhancing one's building skills?

Gillian speaks for many of us when she mentions her love of the Island's rocky shores. That points to something beyond their educational and research value, and beyond utilitarian values such as producing shellfish and seaweeds that can be used for food. It points to the beauty of the rocky shores, and the fact that they can refresh us at a deep level. Many professional environmental scientists are drawn to this sort of work because sometimes in the interstices of doing the data collection there are opportunities to just soak up the beauty of creation. As with a beautiful painting, however, it helps to know something about what you are looking at, and in this respect the book can help anyone make the most of appreciating the shores of south-west Ireland – shores which are among the world's finest. The illustrations and photographs are a great help in this respect.

I've never been to a book launch before, but have seen films of ship launches. So I have a mental picture of breaking a bottle of champagne over the book before it goes sailing off round the coast of Ireland. The mental picture inspires my closing words. The book is named *The Ecology of the Rocky Shores of Sherkin Island.* God bless her and all who sail in her.



The Great Whale Debate

"The whaling debate is as shot through with contradictions as a stick of seaside rock."

By Alex Kirby

THE world's whales, you could say, have had it pretty easy these last 15 years or so. The global moratorium on commercial whaling came into force in 1986, and since some time before that there has been a conservation-minded majority on the International Whaling Commission. After the years of bloody slaughter during the industrial whaling era, when steam and then oil conspired to give the harpooners a decisive and fatal edge over even the fastest-swimming and deepest-diving whales, they deserved a respite. But the days of relative peace may be drawing to an end. Time to dust off the inflatable whales, the bloodstained placards and head once more for the barricades, then? Or time, perhaps, to accept that whales are essentially very large marine cattle, harder to hit but just as legitimate a target as their terrestrial cousins? Whichever way it goes, there are going to be some very loud squeals of protest from someone.

The whaling debate is as shot through with contradictions as a stick of seaside rock. The commission, for a start, was established in 1946 with a dual mandate which today has virtually paralysed it. It was set up to conserve whaling, and also to conserve whales (so there would be enough to catch). That means both sides can sincerely claim to be acting in the spirit of the IWC.

It has never (till this year, at least) sought to protect all whales, let alone all cetaceans (a category which includes dolphins and porpoises as well). The commission has concerned itself only with the so-called great whales, the species of principal commercial interest. Finally, at its 2003 meeting, it did agree to extend its mandate to cover all cetacean species.

The commercial whaling moratorium has compounded the contradictions by not even trying to stop all killing. Two of the leaders of the whaling camp - Japan and Iceland – each continue to kill 6-700 whales a year without infringing IWC rules in any way. Japan does so in the name of research: the commission allows member states to catch unlimited numbers of any species, so long as it is done to advance scientific knowledge. Norway can continue to hunt because it voted against the moratorium when it was adopted. The third whaling nation, Iceland, has restarted research whaling recently, though its case is less straightforward. It left the IWC in 1992 but rejoined in 2002, voting for its own readmission, which was approved by a majority of one.

And the commission itself is only as powerful as its members allow it to be. The anti-whaling majority is being steadily whittled away as more states join and declare themselves in support of the whalers (bribed to do so in most cases by Japan, the story goes). The IWC secretariat, competent, conscientious and scrupulously non-political, is a small group of British scientists operating from a modest house in a suburb of Cambridge. There are no gunboats to enforce the commission's decisions. There is not even a dinghy.

Perhaps the greatest contradiction of all is the clash between the science which is supposed to underpin all the IWC's work, and the emotion which has in fact dominated it for many years. I am not decrying emotion in the least. If we were more emotional we might well have a world which had banned landmines and decided to feed every child adequately. But I do think there will be tensions when an organisation founded to act on science chooses to qualify it.

There is ample scientific justification for refusing to allow any killing of several whale species. The commission's scientists said this year they thought the blue whale, the largest of them all, was finally starting a very gradual recovery from the industrial massacre. They believe there could be up to 1,500 of them in the Antarctic now, three times more than 25 years ago. But in the whalers' "best" year, 1929-30, they killed 30,000 blues in the Antarctic. Recovery is relative.

It is much the same for some of the others, like the northern right whale. For many species, the data is too patchy to be sure. Earlier this year researchers claimed DNA analysis of tissue samples suggested there had once been far more whales than the IWC estimated, and that therefore recovery lay even further in the future than it seemed.

But for some whales, like some populations of minkes, it is very hard to argue a scientific case against killing. You can say whaling is inherently cruel, because of the impossibility of guaranteeing a clean shot and a quick death. You can say whales are special, iconic, too intelligent and sensitive to be butchered. But you will find it hard to argue on scientific grounds that there are not enough minkes for a small annual catch.

This year the commission's annual meeting voted to establish a conservation committee, whose job will be essentially to conserve cetaceans for their own sake, not just to ensure there are enough to hunt. The whalers were appalled at what they saw as an attempt at a fundamental change of purpose. One member of the Japanese delegation, a man respected for his low-key and thoughtful interventions, told me: "It's as if you thought you'd joined a football club, only to find it had become a stamp-collecting society."

The deep divisions which have made the commission virtually dysfunctional for years now threaten to tear it apart. Japan muttered yet again that it might walk out. The difference from previous years, perhaps, is that this time there is some support back home from parliamentarians and public.

If the IWC does fall apart, the three whaling nations will feel free to do what they want. What they want will probably not be very different from what they are doing already. They are unlikely to unleash another bloodbath.

But if there is no commission, there will be no international control of any other countries that may decide to set up as pirate whalers. Then the gates will open with a vengeance. You can tell what species a piece of whale meat has come from if you analyse its DNA. But not every small harbour has the equipment to do so, or the skill and the will to use it. So you could rapidly find not just the relatively abundant minkes being killed, but whales of any species that strays into the harpooner's crosshairs.

If you want to save the whales, the IWC is the best hope for their salvation. But it looks increasingly as if only an IWC which agrees to some limited whaling - based on what the science says is sustainable - can itself hope to survive. A (relatively) few whales may have to die messy and cruel deaths to save the rest.

In 2000 the then secretary of the IWC (he retired soon afterwards), Dr Ray Gambell, told me: "The whale is a high-profile animal. It has become a symbol." A failure to signal the forthcoming end of the moratorium, he said, would mean "a real danger that the commission will lose its credibility totally". Three years on, the whales are no safer and the opposing sides no closer.

Alex Kirby is environment correspondent of BBC News Online (http://news.bbc.co.uk/), and has covered several IWC meetings.

Single Rural Houses

By Catherine McMullin

THE continuing planning debate about 'one-off' single rural houses has created much heat, but cast very little light, on the subject. Apparently irreconcilable views are aired and there appears to be no common ground between both sides. Ireland is at a critical period of development and, if the wrong policies on rural housing are adopted now, major problems will arise in the future. It is time for all sides of the argument to be discussed in a rational manner.

Much of the problem is due to a lack of definition of the terms used and a good example is the very term 'rural'. Many people think of this as the open countryside but the Central Statistic Office (CSO) defines it as any settlement with a population of 1,500 or less – this would include many small towns and villages. For this article, it will be taken to mean the open countryside outside of existing settlements, large or small.

The pressure for 'one-off' housing is different in the east and west of Ireland. The east coast is very much influenced by Dublin and 'dormitory towns' for commuters have developed up to 50-60 miles away. The west coast is not under the same commuter pressure but isolation and second homes create problems. Even within counties there are wide variations with falling populations in isolated areas, pressures for urban generated housing in the vicinity of towns and holiday homes in scenic areas. The rest of this article will deal with the situation in the western side of the country.

Depopulation is a serious problem in some rural areas and there have been attempts to blame this on planning policies that are too restrictive, particularly in relation to single rural houses. It has been claimed that scattered rural housing is part of our heritage and should be facilitated, not restricted.

Before the famine, in 1841, census figures show that about 90% of the population lived in rural areas. However, the first ordnance survey map, dating from the same time, shows people did not live in scattered single rural houses but in 'farm villages' or clachans, consisting of clusters of 15 – 20 houses with open countryside around them. Living together in such communities, work could be shared and carried out more efficiently. The ruins of many of these clachans are still to be seen.

After the famine, the Congested Districts Board, and its successor, the Land Commission, moved people out of these villages into single houses as it was felt disease spread more quickly in crowded conditions. The splitting up of the big estates under the land acts continued this pattern of scattered housing.

Things have now changed, Ireland is an industrial nation, with tourism a major employer, and farming is no longer the mainstay of the local economy. Indeed, many farmers must have off-farm income to survive. In former times, the single rural house made sense as people needed to live close to work but now education has opened up other opportunities and different lifestyles. In the past, people adapted to the changing social and economic conditions of the time. Should we continue to live with an outdated settlement pattern and not seek one more suitable to the 21st century ?

Any settlement strategy must look at the development of both rural and urban areas as both are interdependent. People want to live where they can have a good quality of life and ready access to work, shops, schools and other services. Individual needs vary and a 'one size fits all' approach will not work. A variety of choices need to be available.

Census figures show the population of towns is increasing much faster than rural areas. This is not a sign that people are being forced into towns, rather that they are 'voting with their feet' and choosing to live there. Many people enjoy the convenience of being close to all facilities and places to socialise. Small towns and villages can be very pleasant places in which to live.

Some may prefer the country life and, since about 1970, there has been a drift of people out of towns into the surrounding countryside. There is a marked difference between this urban generated rural housing and the older farmhouses. Modern living requires external services, including piped water, electricity, and telephones and, as these services are normally provided beside the public road, that is where the majority of new houses are sited. The result is ribbon development along all the roads leading out of towns and it is generally recognised that many places within the town catchment area are becoming over-developed.

Rural houses are in demand partly because of the lower site prices but this does not take into consideration the higher long term costs of commuting to work, schools etc, usually requiring a second family car. There are other costs that are not so obvious. An Foras Forbartha, in a study carried out in the mid 1970s, showed that it is more expensive to provide services to rural houses but the extra cost is often borne by the community, not by the individual. Indeed, An Post reminded us recently of the huge losses it incurs providing rural mail deliveries, leading to higher postal charges for everyone.

The recent census figures show that, despite the overall rise in population, some rural areas continue to decline. This is often used as an argument to justify more liberal planning policies all over the county but first the reasons for the drop in population needs to be investigated. In the more remote areas, the decline in farming and lack of alternative employment is an obvious factor. Large tracts of forestry have pushed people out of other areas. Scenic coastal areas often experience a huge increase in the number of houses but the population continues to fall. The extra houses are obviously holiday homes and, in some townlands, they constitute 60–80% of the housing stock.

"A foolproof system for identifying those with genuine needs must be developed with appropriate legal controls to prevent abuse."

Introducing more liberal planning policies will not necessarily revitalise the more isolated areas but it will lead to even more houses within commuting distance of towns. It is becoming obvious that different planning restrictions are required in different parts of the county. More research is needed to develop policies to suit every situation.

The National Spatial Strategy (NSS) published recently, seeks to control the over-development of Dublin and to shift people and jobs to the rest of the country. It advocates the strengthening of designated urban 'gateways' and 'hubs', where we can expect the population to increase. As regards rural areas, it recommends that rural generated housing needs should be accommodated in the areas where they arise and such housing (should) be occupied by established members of the rural community.

The NSS recognises the problems of urban generated housing where people wish to live in a rural area and commute to work in cities and towns. It does not recommend single rural housing, rather that: smaller towns and villages have a key role to play in catering for these types of housing demand in a sustainable manner.

Much of the present controversy centres around the interpretation of the above two paragraphs. It is difficult to define a 'need' to live in the area or what is an 'established member of the rural community'. A foolproof system for identifying those with genuine needs must be developed with appropriate legal controls to prevent abuse.

Another bone of contention is the issue of 'landowner's rights', with many feeling they have a constitutional right to do what they like with their own land. In fact, the constitution does limit property owners' rights so as to protect the 'common good' but there is disagreement as to whether present planning restrictions are constitutional.

There are many other issues also to be considered, particularly the increasing use of the motor car due to the mismatch between location of residences and workplaces. This is both an urban and rural problem and the ever increasing traffic congestion is having an adverse effect on the quality of life for everyone.

In the more isolated rural areas, jobs, rather than houses, are the first priority. Urban generated rural housing must be controlled but the proposal to divert it to the smaller towns and villages will work well only if good infrastructure, including public transport, is available. In practice, infrastructure is often inadequate and public transport almost non-existent so that people become 'car dependent'. Holiday homes should be restricted to those areas where they have no adverse impact.

To conclude, planning policies need to be tailored to suit the particular circumstances of the area, a 'one size fits all' solution will not work. The type of development permitted in rural areas needs to be defined in more detail while the position regarding constitutional property rights must be clarified. Further research is essential and development must be monitored to ensure that policies are achieving their purpose. And finally, a reasoned and informed debate must take place between all the stakeholders to ensure the policies adopted now create a better Ireland in the future.

Catherine McMullin is a scientist by profession but has many years experience of planning issues as a member of An Taisce.

Waste Management in Ireland

By Mary Kelly

THE face of waste management in Ireland is rapidly changing, in some areas for the better, with a more comprehensively regulated waste industry taking shape in recent years. However, there is no room for complacency. Three of the greatest pressures on the efficient management of waste remain and need to be tackled: increasing waste generation, a continuing high dependence on landfilling and the lack of a proper waste infrastructure.

The Environmental Protection Agency is in a unique position to be able to take an overview of the success or otherwise of various waste policies as it has many functions in respect of waste and its management. Earlier this year, the EPA published the *National Waste Database Report 2001* which gave an overview of waste generation and management in Ireland in 2001 and into 2002. It was the third in the National Waste Database series so allowing comparison between these and previous waste statistics. The report described available waste management infrastructure, examined changing regulatory and infrastructural requirements and made recommendations on waste infrastructure, capacity and future management practices. Collation and publication of this data, as reported by local authorities, commercial enterprises, industry and farming, will allow policy makers and decision makers to look at trends in waste management and to examine the effects of different policies on these trends. Waste statistics have become more reliable because of the increased use of weighbridges in landfills and this in turn makes it possible to predict with some certainty the resources needed to manage Ireland's waste effectively.

All parts of the country are now subject to waste management plans produced by local or regional authorities. *A National Hazardous Waste Management Plan* prepared by the EPA is in place. Implementation is weak however, and many of the regional plans are already out of date. Six of the ten waste management planning regions have less than three years remaining landfill capacity. While regional waste management plans may have proposed new recycling and recovery infrastructure, together with landfill and incineration capacity, most of this capacity is not yet in place. The implementation of the plans needs to be accelerated if we are to meet national targets. The plans also need to be reviewed and updated. Waste quantities have grown at rates significantly in excess of those projected when the plans were being prepared and the plans have not kept pace. The range and scale of infrastructure required in each region for a period of at least 15 years should be identified and put in place.

On the positive side, a more balanced waste management infrastructure is taking shape. In line with government policy, the number of operating local authority landfills decreased from 76 in 1998 to 50 in 2001. The number of private sector landfills decreased from 50 to 42 in the same period. Landfills are operating to a higher standard because of waste licensing which began in 1995. Either local authorities or the EPA now regulate all legally operating waste disposal and recovery facilities. The discovery of illegal dumps can be attributed to tighter controls and the fact that local authorities, not just the EPA, are taking illegal dumping seriously. Most local authorities have now taken their environmental responsibilities on board and the noose is tightening around the necks of those involved in illegal dumping.

Parts of the waste infrastructure have improved; significantly, the private sector collected 63 per cent of the municipal waste accepted at licensed facilities in 2001. More transfer stations and composting facilities are coming on stream. There is a need, however, to identify the facilities required to integrate the management of the various waste streams nationally. The movement of waste between regions should also be provided for in appropriate circumstances.

"Overall, there has been a doubling in the actual quantity of household, commercial, packaging and construction and demolition waste being recycled or recovered. While this can be welcomed, the base recycling rate was extremely low and Ireland is still well below the recycling and recovery rates of other European countries."

There have been significant improvements in the provision of recycling facilities. Almost 600 extra bring banks and 23 extra civic amenity sites came on-stream between 1998 and 2001. This contributed to the improved recycling rate of household and commercial waste which increased from 9 per cent to 13 per cent in the same period. Overall, there has been a doubling in the actual quantity of household, commercial, packaging and construction and demolition waste being recycled or recovered. While this can be welcomed, the base recycling rate was extremely low and Ireland is still well below the recycling and recovery rates of other European countries.

While progress is being made in the recycling and recovery rates of some waste materials, future targets will be difficult to attain unless the quantities of waste being generated can be cut. For example, a recycling rate of 25 per cent for packaging waste was achieved in 2001, meeting the EU target for packaging recovery. This was in the face of a 28 per cent rise in the absolute tonnage of packaging waste generated between 1998 and 2001. However, the target of 50 per cent recovery by 2005 will be difficult to attain, particularly if the quantities of packaging waste generation continue to increase.

Ireland's recycling rates are still low by European standards and there needs to be an acceleration in rates of recycling and recovery. This will only occur if a successful market development programme in put in place. It is notable that those countries that are achieving high recycling rates generally have a ready market for recycled material and have access to a network of businesses that utilise the material. Many of these countries have been able to opt for a combination of low or zero landfill with incineration to manage their waste. Ireland does not have this market in place and the situation has changed for the worse recently with the closures of Irish Glass Bottle and Irish Ispat. Although the national target of 50 per cent recycling of construction and demolition waste is being met - over 65 per cent was recovered in 2001 - the recycling rate of household and commercial waste is low.

Despite the economic boom, the generation of industrial waste and hazardous waste stabilised between 1998 and 2001. If we are to seriously tackle the quantities of waste being produced, waste generation in all sectors must be decoupled from economic growth. Limited action, it seems, is being taken to prevent and minimise waste in many sectors. The generation of household waste increased by 20 per cent between 1998 and 2001. Commercial waste generation increased by 53 per cent and construction and demolition waste generation by 35 per cent, largely as a result of the economic boom.

The rate of increase in waste generation in Ireland is simply not sustainable and a culture change needs to be brought about. It is imperative to resource and implement the planned National Waste Prevention Programme to bring about this change. I would hope that when the EPA publishes the next National Waste Database Report we will see evidence of policies implemented on foot of this report taking effect. Then we will know that we are doing our job.

Dr. Mary Kelly, Director General, Environmental Protection Agency, P.O. Box 3000, Johnston Castle, Wexford, Ireland.

"The Steeple" near Kilgarvan, Co. Kerry. All that remains of the above ground buildings of a copper mine. Extensive workings are said to exist underground.

Bloomeries & Cornish Chimneys

Industrial West Cork and Kerry

By Daphne Pochin Mould

PEOPLE looking at the bright colours and clean air of West Cork and Kerry exclaim at the "unspoilt" landscape and regret the building of new houses in contemporary styles. But if by "unspoilt" you mean the work of nature alone, you are very wrong indeed, for you are looking at an old industrial site and its consequences.

All those bare, rocky hillsides were once heavily wooded. Scant remnants of the Irish oak woods survive in Killarney, as the equally extensive forests of the Scottish highlands came to be represented by the pines of Rothiemurchas in the Cairngorms. There were trees everywhere, lots of trees. Oaks, of course, the tall evergreen pine, willow and alder in the wetter spots, the birch golden leafed in autumn, and ash. Long, long ago by some chance or accident, one supposes, people found that intense heat would smelt certain compound minerals and a metal could be produced. The rocks of West Cork are highly mineralised, and by the early Bronze Age men were at work, locating copper ore, mining it and smelting it in little primitive kilns, and used the trees to do it. These early mines were small caves, cut not very far into the hillside and excavated by "fire setting". A fire was set against the rock and the heat shattered stones breaking out, with natural boulders for hammers. The ore was picked out and smelted and a block of copper produced. It was very pretty but if you wanted to make an axe or other hard wearing tools, it needed to be alloyed with tin to make bronze. There was no tin to hand so they headed off by ship to that great tin producing country of Cornwall and traded for the vital metal with what Ireland produced.

The ancient world knew many long distance routes, by land and sea, to obtain what it wanted: Bronze Age folk could and did build sea going wooden boats, of which remains have been found. The West Cork and Kerry folk had plenty of good oak to build vessels capable of carrying trade goods and bringing back a load of tin.

The oldest Bronze Age mines are in Killarney's Ross Island (where a mining trail has been laid out) and have been dated to c. 2400-2200 B.C.. Those on Mount Gabriel in the Mizen peninsula, Co. Cork, are the most exciting, in that they were overgrown with peat and only re-entered by men and excavated in the 20th century. There are 32 tiny mines on Mount Gabriel, dated to 1700-1500 B.C. They are one of the most important such sites in Europe and are listed as a National Monument. On the top of the hill are the domes of the aircraft tracking station: from the beginning of technology to the latest!

But the great destruction of the Irish and Scottish woods came in the 17th century with Sir William Petty and his short lived English colony at Kenmare; Sir Walter Raleigh at Youghal (and later the Boyles of Lismore) and the East India Company ship building on the Bandon river at Downdaniel, between Innishannon and Bandon. Timber was needed for everything from ship building (no iron ships till the mid 19th century) to staves for barrels (in which meat and fish were salted in pre-refrigeration days) and for iron smelting. Iron was increasingly wanted for making contemporary "weapons of mass destruction", cannons and guns. Smelting requires very high temperatures that only charcoal could produce. So charcoal burners came to dot the landscape and timber was cut and burnt in small kilns, in which the inflow of air was restricted so that the wood charred and did not burn out. You may, on the hills of Cork and Kerry, yet come across charcoal traces on some of these sites. The iron ore was shipped into where the woods, smelted on site and the metal exported again. Bloom is the name given to the smelted mass of metal and the furnaces are therefore known as bloomeries. Their sites today are poorly marked, but you may find some deposits of slag scattered there. But the list of bloomery sites is long: in the west are Adrigole, Bantry, Coomhola, Dunboy, Downdaniel, Glengarriff, Macroom and Roaringwater Bay. By the time it was found that coke was the better fuel for smelting, the woods were gone.

Gunpowder magazine, Dhurode, Co. Cork. Gunpowder was used in blasting the copper mines in Mizen peninsula.

Exploring an early 19th century County Cork lead mine.

Typical Early Bronze Age copper mine. Coad mountain, Co. Kerry. Later used as a hermitage by St. Crohan.

Photos: © Daphne Pochin Mould

Dhurode copper mine, Mizen peninsula, Co. Cork. A very dangerous, deep shaft made safe.

With the Industrial Revolution, the need for metals set people prospecting again and brought large scale copper mining to West Cork and Kerry. The Muckross and Ross Island mines at Killarney were working at the end of the 18th century and a huge steam engine on Ross Island pumped the water out of the workings and back into the lake. The most profitable was Allihies on the Beara peninsula which made the fortune of the Puxley family in the 19th century (and gave Daphne du Maurier the theme for her novel "Hungry Hill"). The work began in 1816 and even continued, off and on, until 1930. Post World War II, there was some talk of re-opening it and surveys carried out there. But there are easier places to win copper these days.

Allihies is the site with the most extensive remains. It is also the best documented mine of any in Ireland or Britain - thanks to the preservation and discovery of a vast treasure of mine papers. Some 1000 people worked there in dark and dangerous conditions and steam engines kept the workings free of water. These were the massive beam engines of the first days of steam - beam engines in which the steam worked one arm of a pivoted beam and the other arm worked the pump. They were shipped into the locality, set up on site and an engine house built for them with its tall Cornish chimney. The Cornish, who had been mining from prehistory to the last decades of the 20th century, were the experts and as such were brought to Allihies and given their own "Cornish village" (which is still there) and the best of treatment. Their furnace chimneys were built of cut stone till the very top, with brick then used, as it is easier to fit into the small circle there.

But there were old copper mines all over West Cork - some thrived, some didn't: Dhurode, with its reservoir system from the mountain above and pretty powder magazine, Crookhaven, Sheeps Head, Cappaghglass and Kilgarvan.

Galena (lead) was worked at Ringabella, manganese at Leap, barytes near Schull, and in our own time, in a very clean and modern mine at Duneen on Clonakilty bay (now closed). Silver is associated with lead ore, and West Cork has shown some tiny traces of gold, as in Somerville & Ross's story of the Irish R.M. and the failed "Harringtons" mine: "Copper and precious little of it and they got some gold too - just enough to go to their heads and ruin them". The various ores from the mines were shipped out to Swansea for smelting.

"Unspoilt" country? Rather a museum of metal working from the earliest times to now.

Allihies, Co. Cork. Engine house and Cornish chimney looking out towards Dursey Island.

CAUTION

The history of these old mines and visiting their sites are fascinating studies. But take care! Mining, of its very nature, makes rocks unstable. Wooden pit props, platforms and ladders have all rotted and deeper levels will be flooded. So do not venture into old mine workings unless you have got reliable information about their condition and are properly equipped. Have hard hats, boots, rope, torches and a "minder" outside waiting your return. Most old shafts are fenced, or filled in, but not all. Watch your step!

Nature on Irish Canals

Illustrations: © Dúchas - The Heritage Service

WATER has been used as a means of transport since prehistoric times. In the early days the natural rivers were used. The Shannon was then the main route from north to south through the country. The first attempt to alter and improve on the natural waterways networks was the cutting of a channel - Friar's Cut - through an island in Lough Corrib at the end of the 12th century.

Work on the Newry Canal began in 1731, making it the first summit level canal (a canal which crosses the watershed between two natural waterways) in Ireland or Great Britain. The Ballinamore and Ballyconnell Canal (now restored and called the Shannon-Erne Waterway) was opened in 1860. Between these two dates a number of navigation schemes were carried out, some more successfully than others, and an extensive network of canals and navigable rivers was developed.

Construction of the Grand Canal began in 1756. Thirty three years later (five years before the first boat made the journey from Dublin to the Shannon on the Grand Canal) work began on the rival Royal Canal. Both canals linked Dublin with the Shannon, the Grand at Shannon Harbour near Banagher and the Royal at Cloondara near Tarmonbarry.

Trade on the canals declined as first the railways and then the roads were developed. In 1961 the Royal Canal and a number of the branch lines of the Grand Canal were closed to navigation. It appeared at the time that the canals did not have a future. However attitudes changed over the next twenty years.

In 1986, in recognition of their potential as recreational and heritage resources, the canals were transferred from CIE, the national transport authority, to The Office of Public Works (OPW) to be developed as public amenities. The Heritage Act (1995) confirmed the importance of the waterways as part of the national heritage. The Waterways Service was part of the Dúchas - The Heritage Service but Waterways Ireland, one of six North/South Implementation Bodies under the terms of the British/Irish Agreement, now has responsibility for Irish canals.

Although the canals are man-made and not natural systems they are very important wildlife habitats. Since they were first built, a great diversity of wild plants and animals has moved in and colonised the banks and the water. The ecological value of the canal lies more in the number of species it supports along its linear habitats than in the presence of rare species, although some rare species can be found. The canals cross through agricultural land and therefore provide a refuge for species threatened by modern farming methods. Many species that were once common in the countryside but which are now becoming rare still thrive along the canals.

The ideal canal has a clear central channel; a wide band of vegetation along both banks, consisting of reeds and wild flowers; short grass on the towpath, with longer grasses and flowers on either side of it; a species-rich hedgerow on the boundary; and a variety of habitats on the non-towpath side - woodland, scrub or grassland.

For most of its length the towpath is bordered by a hedgerow. Hedges provide shelter and protection for birds and small animals. Hawthorn is the most common tree in the hedgerow, although most hedges contain a mixture of plants - a wild flowers as well as shrubs and trees.

The hedges were planted when the canals were constructed over 200 years ago. Hawthorn was the most popular hedging-plant because of its ability to form a dense hedge quickly. Over time other species including brambles, wild roses, Ash, Elder and Blackthorn have found a home in the hedges.

The strip of land between the boundary hedge and the towpath is particularly variable in terms of the range of habitats it supports. In some places the hedgerow plants have spread out to cover a relatively large area with scrub. In other places the coarse grasses and tall wildflowers that grow at the base of the hedge grow out towards the towpath. Meadow grassland, with its range of finer grasses and wild flowers, can also be found here.

The towpath ranges from road or tarmac path with not plants at all growing on it to dense vegetation, which may be quite difficult to walk through in summer. In general, however, the plants growing on the towpath are shorter than those elsewhere on the banks. The more common towpath plants are those that have adapted some means of coping with the effects of constant trampling.

Between the channel and the towpath is another strip of tall vegetation. Most of the wildflower species in this zone are capable of growing in damp or waterlogged soil. Meadowsweet, with its creamy flowers and heavy scent, is very common along the canal banks. Yellow Irish, a wild cousin of the garden species, provides a splash of colour in early summer.

The reed fringe is the band of vegetation along the water's edge - plants with their roots in the mud of the canal bed and their leaves and flowers rising above the water. It is extremely important to the health and well-being of the canal. The plants of the reed fringe protect the canal margins from the wash of boats, absorbing the wave energy which could damage and erode the banks. They provide food, shelter and breeding sites for a variety of different aquatic animals. In addition, by using up excess nutrients in the water, they can prevent the growth of algal blooms.

Aquatic plants in canals are often referred to as weeds, suggesting that they are nothing more than a nuisance in the water. This is far from the truth. They support a wide variety of invertebrates, which in turn support the populations of coarse fish and water birds that people associate with the canal. They offer cover for fish, both predator and prey species, and they provide safe sites where aquatic invertebrates and fish can lay their eggs.

Scrub is often found along the canals, particularly on the bank opposite the towpath. The plants of scrub and hedgerow are similar, though the scrub is wider and more dense. An unmaintained hedge rapidly develops into scrub and grows out over the adjoining habitats. Regular trimming of hedges keeps this tendency to develop into scrub in check. However scrub is a very valuable wildlife habitat, and adds to the diversity of habitats and therefore to the nature conservation interest along the canals.

Woodland is not a common habitat along the canals as there is rarely the space for it to develop between the

CANAL FOOD WEB

1. Primary Producers

Green plants make their own food from carbon-dioxide and water, using sunlight as their energy source.

2. Invertebrates

Animals without backbones, such as insects, can be herbivores (plant-eaters) or carnivores (meat-eaters). For example, caterpillars are herbivores and eat leaves: while under the water dragonfly larvae are ferocious carnivores. Carnivorous invertebrates, both aquatic and terrestrial, eat other invertebrates.

3. Invertebrate Life Cycle

Many aquatic invertebrates have an aerial phase in their life-cycle, when they live above the water, not below it.

4. Birds

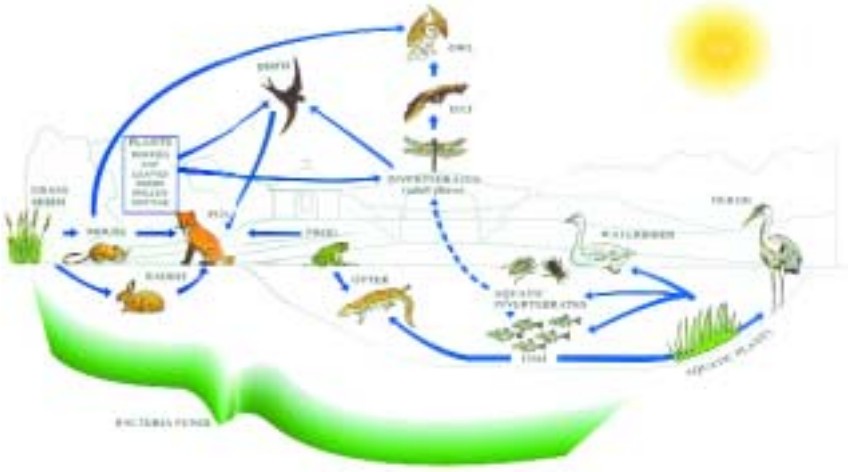
Birds can also be herbivores or carnivores. Many are both, eating seeds and berries as well as insects and other invertebrates. Larger birds can hunt and eat relatively large prey - Herons are very efficient at fishing, while owls catch bats as well as mice.

5. Fish

Some fish are herbivorous, and eat only underwater plants. Others are carnivorous and eat aquatic invertebrates. Pike are also carnivorous - they eat smaller fish!

6. Bacteria and Fungi

All living things, plants and animal, die and are broken down by bacteria and fungi. Nutrients are thus returned to the soil to be used by green plants, and the cycle continues.



boundary and the towpath. Where it does exist, it is usually a mixed deciduous woodland. The trees and shrubs shelter the ground layer plants, protecting them from extremes of temperature and from winds.

Without maintenance the habitats along a canal change - a process called natural succession. The reed fringe gets wider as it extends out into the open water. The water itself gets shallower as silt builds up in the channel. The hedgerow grows out over the towpath, and scrub replaces grassland on the banks. In time the scrub can extend to cover what was once the bed of the canal.

Restoration of the canal means clearing towpath, and dredging and rewatering the channel. In the short term this restoration work can leave the canal and its banks looking a bit like a building site. With time, however, the system can and does recover.

Where the canal channel was still wet and was filled with marsh plants before restoration the marginal vegetation recovers relatively quickly. After only one growing season the reed fringes are established. Where the old channel had dried out totally and supported dry grassland or scrub, the reed fringes and aquatic vegetation take much longer to become established - but they do return.

In the long term the banks and the water are recolonised with plants and animals in the same way that the canal was first colonised over two hundred years ago, when it was built.

Most of the wildlife that you see as you walk the canals is there not because it was planted or placed there by anyone, but because it has "moved in" of its own accord in the two hundred years since the canals were built. The seeds of some plants blew in from the surrounding countryside. Others are carried on birds' feet or on the fur of the animals as the animals and the birds themselves moved in to colonise this new set of habitats. Boat traffic helped to spread water plants from the Shannon eastwards through Leinster along the canals.

What all these plants have in common is that they will only stay in the canals or on their banks for as long as conditions remain favourable for them. And the animals, large and small, all depend ultimately on the plants for their survival - they all either eat plants themselves or they eat other animals that eat plants. If the plants are lost, the animals will be too. It is up to all of us to see that this does not happen. One of the ways of doing this is to learn all about the wildlife you can see along the canals, and find out what you can do to protect it.

There is a wide range of books and field guides available today to help you to identify what you see - guides to the wild flowers, to the trees and shrubs, to the birds, to mammals and their tracks, to insects and to the vast array of underwater invertebrates that you will probably never see unless you really look for them.

The most important rule for successful nature watching is that you should always bring the book into the field with you instead of trying to bring the field back home to the books. Limp and bedraggled pieces of plants are hard - usually impossible! - to identify. In addition, by picking plants or capturing insects you are denying others the same pleasures you got from looking at these living things in their natural environment. Take a camera or a sketch book out with you if you want to bring souvenirs home.

When nature watching along the canals never forget that water is dangerous. Locks are particularly hazardous - the water in the chamber is deep, the walls and floor are stone and the sides are steep and slippery. Be sensible and you will be safe. Don't swim in the lock chambers. Don't fool around on the canal banks. Don't play with the safety equipment - it is there for a purpose, and one day it may be you who needs it. Most importantly - HAVE FUN!

Excerpts from "Nature on Irish Canals", produced by Dúchas - The Heritage Service.

May 1991 - before restoration

June 1991 - immediately after restoration

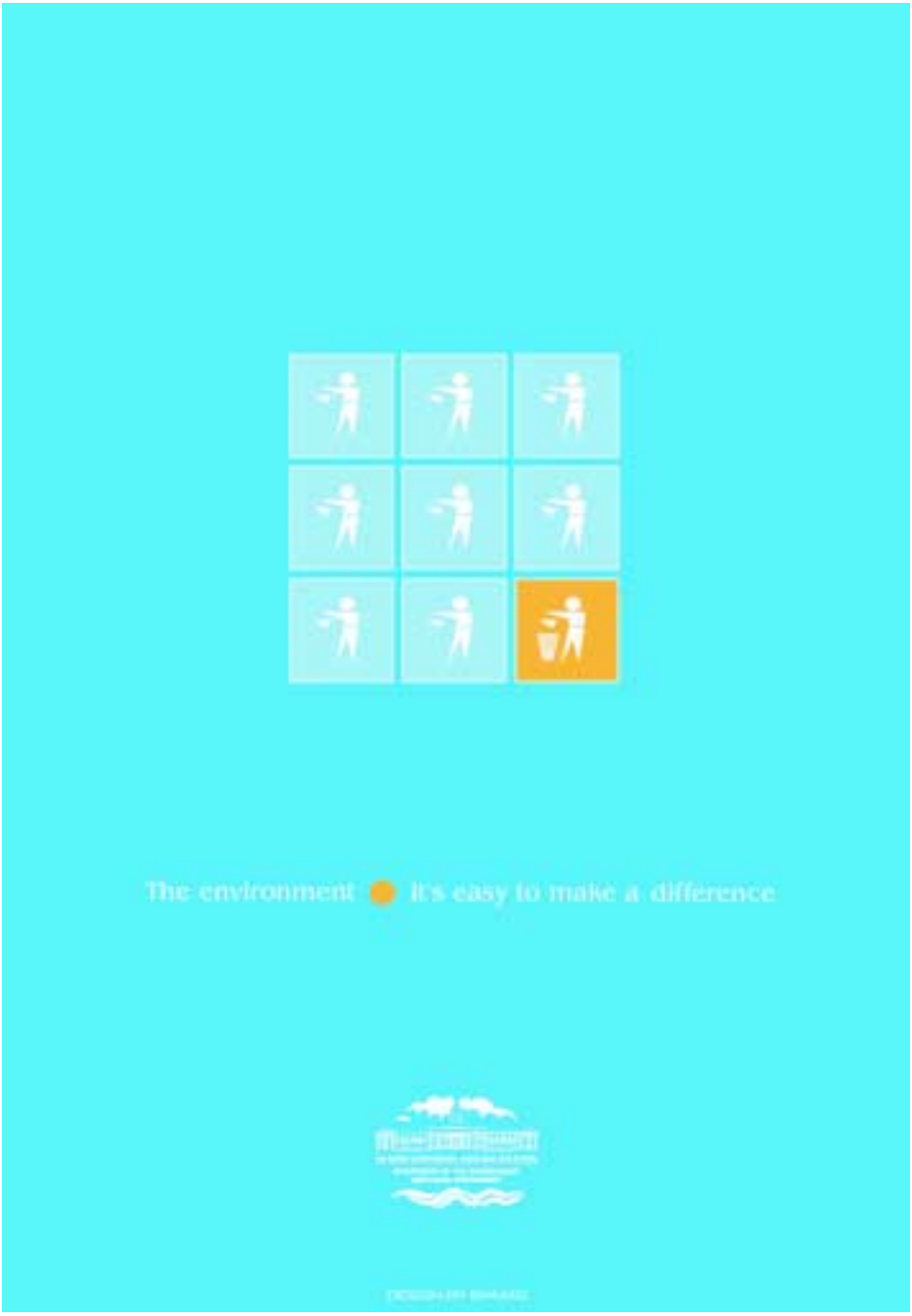
May 1991 - one year after restoration

The restoration of the Royal Canal - the view west from Kildallan Bridge between Mullingar and Ballynacargy in Co. Westmeath.

(right) Herb Robert, a very common plant in the canal hedgerows, flowers throughout the summer, from May to September.

(below) Many species of butterfly and moth can be found along the canals.

Waterways Ireland, one of six North/South Implementation Bodies under the terms of the British/Irish Agreement, now has responsibility for Irish canals and can be contacted at 20 Darling Street, Enniskillen, Co. Fermanagh, N. Ireland.



Publications of Interest

The Broads

By Brian Moss

HarperCollinsPublishers

www.fireandwater.com

ISBN: 000 712410 4

2001 / 392 pp / £19.99stg

The Broads are situated in Norfolk East Anglia and a bit of Sussex. They are a set of around 50 very small lakes linked with four rivers. The words of the author in his Foreword encapsulate this book. To quote "I am an academic and enjoy the proper role of academics to say what I think and not what is politically expedient or locally convenient. I hope this is a ruthlessly honest account." This book is a breath of fresh air. It brings the Broads to life: its history, freshwater biology and conditions, vegetation, fauna and flora, and geology. He carried out major research in the Broads for many years from his base at the University of East Anglia. The book has 17 chapters but it is Chapter 16 that carries all the punches, entitled "What Can Be Done? The Current Condition of the Waters and their Restoration". The author is true to his word - the book is a revelation. It is ruthless and honest about what is necessary if the Broads are to be saved.

Killer Algae
The True Tale of a Biological Invasion

By Alexandre Meinesz
(translated by Daniel Simberloff)

University of Chicago Press

ISBN 0-226-51922-8

1999 / 360 pp / US$25.00

In 1982 a beautiful green algae (seaweed) Caulerpa taxifolia arrived at the Oceanographic Museum of Monaco where it was cultivated in the tanks. Two years on the alga was discovered in the sea occupying only a square metre, under the windows of this world-renowned institute. Six years later the alga was noted 0.5 kilometres from Monaco along the French coast. It was growing unrestrained, covering and then eliminating many plants and animal species. By 1997 it had invaded 99 sites, west as far as Spain and east into the Adriatic Sea, totalling more than 4,600 hectares. This book, by Alexandre Meincoz, unravels the intriguing story of the advance of this seaweed along the Mediterranean coast. The treatment he received from French scientists and bureaucrats alike was appalling. They did everything to hinder his investigations, especially denying that the Museum was in any way at fault. This true story is gripping, like a novel one wants not to put down. The author is a man of exceptional courage, a true scientist, who continued to investigate this killer alga against all the odds.

Butterflies

By Dick Vane-Wright

Natural History Museum Publishing

www.nhm.ac.uk / shop

ISBN: 0 565 09179 4

2003 / 112 pp / £9.95stg

&

Dragonflies

By Steve Brooks

Natural History Museum Publishing

ISBN: 0 565 09180 8 (Dragonflies)

2002 / 96 pp / £9.95stg

Knowing little or nothing about butterflies, I have been given a wonderful insight into these beautiful creatures through this book. It contains easily understood text and wonderful photographs: a batch of eggs laid under a stinging nettle leaf; a butterfly beautifully preserved in a piece of Dominican amber - about 20 million years old; a mocher swallowtail with her tongue hanging out. These are but an example of many detailed butterfly photographs and the book also provides some photographs of the differences in butterfly species worldwide. One learns from the text how long a butterfly lives, its courtship, mating, laying eggs, eating habits, communicating. The butterfly has at least five senses: smell, sight, hearing, touch and taste.

The Natural History Museum have also published a similar book on dragonflies and like the butterfly book this brings you through their various life stages: eggs, hatching, feeding, lifespan, how it defends its territory etc.. For the beginner these books are a wonderful introduction to these species. Highly recommended for young and old.

The Birdwatcher's Yearbook and Diary 2004

Edited by David Cromack

Buckingham Press,
55 Thorpe Park Road,
Peterborough, Cambridgeshire
PE3 6LJ, UK.

ISBN: 0 9533840 71

2003 / 352 pp / £13.50stg
(plus £2.00 postage in Europe)

Now in its 24th year this yearbook is, as usual, full of information. The features sections include new discoveries, animal website survey covering overseas birds and birding locations, directory of English language and bird magazines. Other sections include: day by day diary; log charts explaining the new BOU order of species lists; directory lists; book publishers; equipment, holidays; bird reserves and observation; county directory, etc.. As always, highly recommended for the bird enthusiast.

Bound for Australia
The loss of the emigrant ship "Tayleur" at Lambay on the coast of Ireland

By Edward J. Bourke

Available from leading booksellers or from the publisher, Edward Bourke, 33 Rushbrook, Blanchardstown, Dublin 15, Ireland.

ISBN: 09523027 3 X

2003 / 236 pp / €18.00

This is the story of the sailing ship "Tayleur", which was lost at Lambay, just north of Dublin, on 21st January 1854. Of the 650 aboard only 290 survived - amongst those only three of the hundred women and three of the fifty children reach shore alive. There were several Inquiries, which sought to explain the loss of a brand new ship. She was at the forefront of sailing design and was the longest sailing ship in the British fleet. The author has undertaken wonderful research into the building of the ship, the loss, and the legends and also details the list of passengers and the various artefacts that have been recovered by divers, as the wreck is so easily accessible. A great story from cover to cover.

Arable Plants
a field guide

By Phil Wilson & Miles King

English Nature & WildGuides Ltd

www.wildguides.co.uk

ISBN: 1-903657-02-4

2003 / 312 pp / £15.00stg

This attractively presented, exemplary guide identifies the rare and declining wild plants of UK arable land and is a practical handbook to their conservation. A wide-ranging introduction discusses the history, cultural significance, ecology, conservation and biology of plants often dismissed as 'weeds'. In the main section, 100 species accounts have a colour photograph and concise description, a distribution map, and notes on habitat, management, seed biology, life history and reasons for decline. Other sections cover keys, management, native and threat status, and references. A masterpiece!

– John Akeroyd

Links between Biodiversity Conservation, Livelihoods and Food Security
The sustainable use of wild species for meat

Edited by Sue Mainka and Mandar Trivedi

IUCN - The World Conservation Union 2002

www.iucn.org / bookstore

ISBN: 2-8317-0638-6

2002 / 135 pp / £13.50stg

These proceedings from a workshop on the sustainable use of wild species for meat are a revelation. We hear much of declining numbers of wild animals in many countries in Africa, many of whom are being killed by humans. But behind this problem is the fact that there are people in need of food. For example in rural areas in Kenya 80% of households consume 14.1 kg of bushmeat per household each month. The workshop recommends solutions, which are essential if bushmeat consumption is to be reduced in order to save certain species from near extinction. This book is a fascinating read for anyone wanting to understand the problems facing many of the wild animals populations in Africa today. It is so easy for us westerners to criticise - maybe its time we first understood the issues.

Management Guidelines for IUCN Category V Protected Areas
Protected Landscapes/Seascapes

By Adrian Phillips

IUCN - The World Conservation Union 2002

www.iucn.org / bookstore

ISBN: 2-8317-0685-8

2002 / 122 pp / £14.50stg

This is a very important reference source for anyone such as Government, Local Planners or NGOs involved in planning or in managing protected landscapes/ seascapes. In the IUCN system of protected area categorisation, it is known as Category V. This approach is not a soft option. Managing the interface between people and nature is just about the toughest challenge facing society. The book has seven main sections laying out principles and policies. Included also are 26 case studies from most continents. Essential reading.

Achieving Sustainable Fisheries
Implementing the New International Legal Regime

By Charlotte de Fontaubert and Indrani Lutchman

With David Downes & Carolyn Deere

IUCN - The World Conservation Union 2003

www.iucn.org / bookstore

ISBN: 2-8317-0697-1

2003 / 177 pp / £16.00stg

This is a major contribution to what is necessary to achieve sustainable fisheries worldwide. It begins with the historical perspective and the now scarcity and shut down of whole fisheries. It points out that fishing vessels are becoming bigger, the equipment aboard is becoming more sophisticated and fishermen are burdened with loans they cannot repay. Chapter two discusses the guidelines for Fisheries Management in the exclusive economic zone and problems with straddling stocks, migratory species. Chapter four looks at new technical approaches in Fisheries Management with reference to the precautionary and ecosystem approaches. In Chapter five "The Challenge of Enforcement - Illegal, Unreported and Unregulated Fishing" one learns that one can re-flag vessels in other countries, in order to avoid the treaty obligations, with the click of a mouse on a website.

This publication aims to examine the mosaic of new international fisheries instruments and measures and to interpret them in a set of clear rights and obligations which, if properly implemented, will help address this conservation problem. It includes the text of the International instruments that can be used to enhance sustainable fisheries. This book is a must for anyone involved in fisheries.

Making Waves
Integrating Coastal Conservation and Development

By Katrina Brown, Emma L. Tompkins, W. Neil Adger

Earthscan Publications Ltd.

www.earthscan.co.uk

ISBN 1 85383 912 4

2002 / 164 pp / £`17.95stg

Worldwide over a billion people live in what is defined as coastal zones. This makes the challenge of sustainability in these areas crucial for the multiple-use resources which are constantly under pressure from so many different sources. The authors present a variety of methods and techniques that can be used to highlight and promote sustainable decisions among the various users. The most important message coming from this book is that all stakeholders need to be involved in the selection of evaluation criteria. Local residents may not be aware of the important and complex environmental impacts of certain development and regulators or scientists may not understand local issues. Thus this book is especially suited to planners, scientists and NGOs.

Photos © Jenifer Baker

Searching for 'mini-beasts' in the educational area, Ruyton-XI-Towns churchyard, Shropshire, UK.

Conservation and Education in Churchyards

By Jenifer Baker

CHURCHYARDS often contain remnants of ancient grassland, never ploughed or re-seeded and consequently rich in species. Typically there are also other habitats (such as old trees, hedges, banks, and walls) each with its characteristic species, so in general churchyards may be regarded as oases for a rich variety of wildlife. Their significance for conservation is reflected in the fact that many English and Welsh churchyards have been designated as sites of importance for nature conservation. For example, in the arable landscape of Norfolk, six species of meadow plants have at least 50% of their county population within churchyards. In Ceredigion (west Wales), 99% of the county's green-winged orchids are in churchyards. Butterflies, bees, and a variety of other invertebrates also find a haven, as do birds and small mammals.

Ecological work carried out during 2003 in the churchyard of my own village (Ruyton-XI-Towns in Shropshire, UK) has turned up over 100 species of native plants, many of which are rare or non-existent in the surrounding countryside; and an interesting diversity of insects including a rare species of bee. At the same time, the nearby primary school has been looking for a place to use for wildlife and conservation education, and has concluded that there is nowhere suitable within the school grounds. The obvious solution is for the school to use part of the churchyard as an educational area, and this is currently being developed along the following lines.

The hay-meadow management technique (cutting once a year to encourage wild flowers) in operation at Horton-in-Ribblesdale churchyard, Yorkshire, UK.

First, experimental enclosures in the oldest little-visited areas have been left uncut to see what flowers appear throughout the year. There has been a succession of buttercups, speedwells, ox-eye daisies, birds-foot trefoil and other striking species, forming an obvious contrast to adjacent regularly mown areas. All residents of the village have been given the opportunity to make comments through the parish newsletter, and there have been some expressions of interest and no objections. It is therefore proposed to manage these areas like hay-meadows, with cutting once a year during the summer holidays. This means that in the summer term, the children will have the opportunity to see and identify plants, to make comparisons between cut and uncut areas, to observe butterflies feeding on the flowers, and so on.

Second, a secluded area under the trees at one end of the churchyard is being developed as 'hotels for mini-beasts'. Mini-beasts, meaning small invertebrates such as wood-lice, millipedes, earwigs, worms, and various species of snails and slugs, feature on the science curriculum. They offer much - it is fun finding them, their shapes are diverse, and they move and feed in different ways. Mini-beasts are being encouraged to make their homes in the educational area by providing 'hotels' in the form of low piles of logs, stones, and old flower pots, all discreetly located in the vegetation under the trees.

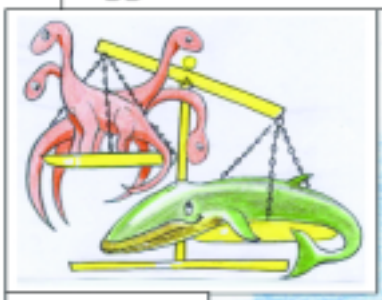
Third, consideration is being given to using the churchyard as an inspirational area for art and for writing. For instance, children may be asked to walk around slowly, then sit for a little while in a quiet place, then close their eyes and become aware of sounds (such as bird song). Their feelings then become the basis for creative work such as writing a short poem. Like many churchyards, there is a special atmosphere of peace, of the sacred, which may be sensed by children if only they are given the opportunity.

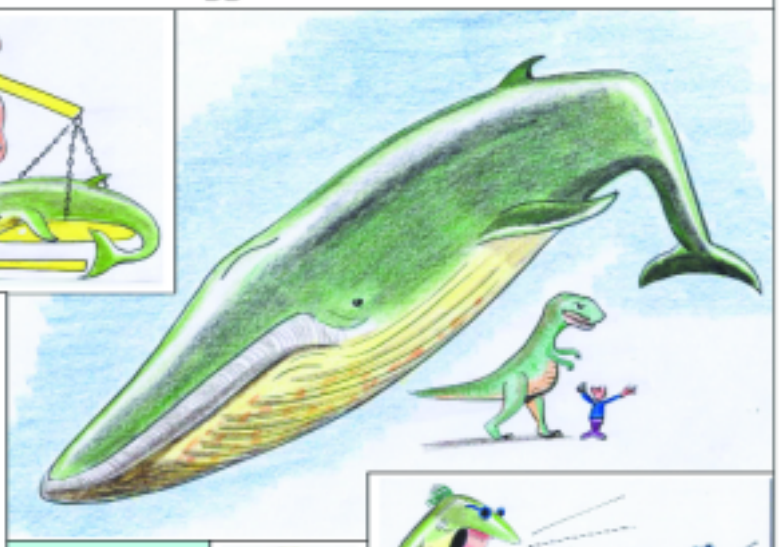
What could be more appropriate than using some of our sacred space as a Noah's Ark for species under pressure? As Nigel Cooper (biologist and priest) has said 'The more we are able to manage churchyards for wildlife, the more we may be able to influence others to do the same for whatever land they have responsibility for. Churchyards can become highly visible examples of good practice in nature conservation'.

Dr Jenifer Baker has worked all round the world as an environmental scientist specialising in oil spill response, and is currently a theological student.

Junior Pages Junior Pages

Bigger than the biggest dinosaur . . .





The **blue whale** is the largest animal that EVER lived; the largest ever caught was 29 metres long and weighed 158 tonnes. It's heart would have been as big as a Volkswagen "beetle" car and its aorta (the largest blood vessel in the body) wide enough for a person to crawl through.

The largest dinosaur that ever lived – the brontosaur – weighed only 30 tonnes a quarter of the weight of the average fully grown blue whale.

Blue whales were hunted almost to extinction until the International Whaling Commission declared them to be a protected species in 1966.

Stop Press

Blue whales recovering

Scientists believe the Antarctic population of blue whales could be three times larger than it was 25 years ago – rising from 500 a quarter of a century ago to 1,500 now – according to the June meeting of the International Whaling Commission.

Source: Alex Kirby BBC

Check it out on:

http://news.bbc.co.uk/2/hi/science/nature/2998120.stm

Captain Cockle's Log

Welcome aboard shipmates! Together, we'll be taking a look at the world's greatest natural resource – one that covers two-thirds of the earth's surface – the sea!

Words & pictures by John Joyce
www.cockle.com © John Joyce 2003

. . . Louder than the loudest rock band

Blue whales are the loudest animals on earth. When they call to each other, their low frequency whistles rise up to 188 decibels – louder than a jet engine (at 140 decibels) and MUCH louder than human shouting (at only 70 decibels). Any sound over 120 decibels is painful to the human ear.

Check out these amazing facts . .

The tallest mountain in the world is the submarine volcano at Mauna Kea in Hawaii, whose cinder cone stands over 9,000 metres above the ocean floor.

This makes it slightly higher than Mount Everest which stands 8,850 metres above sea level and was first climbed by Sir Edmund Hilary in 1953.

Robo-Cod?

American scientists have developed small robot submarines called Automated Underwater Vehicles (AUV's) to carry out research underwater. Some will be fitted with advanced high-resolution sonar to identify individual fish species by way of neural net programming. The US Navy plan to have some 117,000 robots in the water by the year 2012.

Check out these websites

Blue whales:
www.enchantedlearning.com/subjects/whales/species/Bluewhale.shtml

Jellyfish:
www.aquarium.org/jellies

Automated Underwater Vehicles:
http://www.mos.org/oceans/scientist/subnews2bles.html

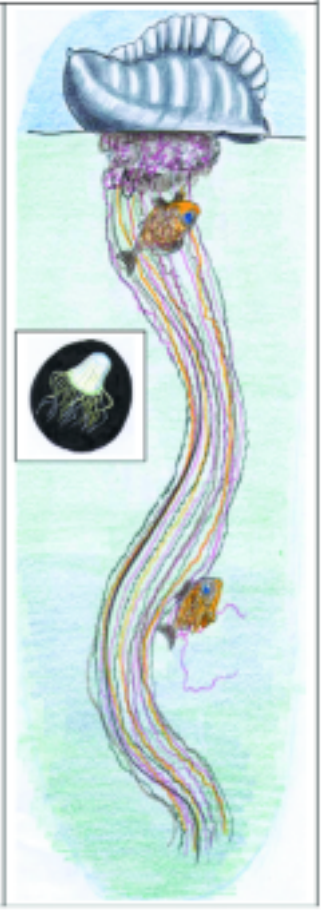
Jellyfish

While most jellyfish in Irish waters are harmless a few – like the Portuguese Man O'War (*Physalia physalis*) – can give a nasty sting.

Beneath the gas-filled float, its tentacles can reach down as far as twenty metres – loaded with stinging cells capable of catching small fish and giving anyone who touches them a painful sting.

The most deadly jellfish in the world is probably the box jellyfish or sea wasp (*Chironex fleckeri*) which, luckily for Irish swimmers, only lives in warm, tropical waters. This jellyfish feeds on shrimps in inshore waters and need a strong poison to knock out their prey quickly. But the poison is so strong that contact with only 3 metres of tentacles can be fatal to an adult.

The best advice about jellyfish is to stay well away from ALL of them and not to touch even those you find washed up on the shore.



Feeding Wild Birds

By Declan Murphy

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. Here are some ideas about how to help the birds in your area.

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. The three members of the tit family will display many acrobatic feats as they all jostle to get at the choicest peanut! Depending on where you live you might get the brightly coloured Goldfinch visiting to feed on your feeders. They have only learnt to take advantage of this food source in the past few years and are still learning. They usually come in flocks of half a dozen or so and are sure to brighten up a dull day. Siskins often arrive at peanut feeders from mid-winter on and provide great entertainment as they feed upside down and defend the feeder from other, larger finches. Another unusual visitor is the Redpoll, a small member of the finch family with a neat red patch on the top of its head. It is a shy bird and not often seen in gardens.

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, who can be seen endlessly flying to and fro with a seed in their bill to cache it in a safe place for retrieval at a later stage.

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. These are a migratory thrush from Scandinavia, so called because of the lovely flash of red on the underside of their wings. If you cut some of the apples in half and spear them onto the branch of a tree you might attract a Blackcap, a type of warbler that visits Ireland in the spring and summer months but which overwinters in small numbers. This is mainly due to the fact that they have learnt to feed at bird tables and feeders and no longer need to rely on their normal summer diet of insects.

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.

The Magpie

IF any bird were to score a zero in the national bird popularity stakes it would have to be Magpie! Its loud raucous nature and unwelcome habit of feeding on many of our nesting garden birds has made it one of our most unpopular birds!

The reason for the Magpie's success is that it is an opportunist and is as much at home feeding from our overflowing dustbins and rubbish bags as it is plundering a Blackbird's nest. Their omnivorous diet includes fruit, seeds, worms, grubs, eggs, young birds, carrion, small mice, insects and frogs.

Despite their fearsome reputation, Magpies rarely capture full-grown birds. They usually confine themselves to robbing nests and eating chicks in spring and summer when birds are nesting. By contrast, the Sparrowhawk kills birds all year round and consumes about 16 kilos of songbirds every year, a far greater quantity than any Magpie. Likewise, cats have a far greater impact on songbird numbers than Magpies. In Britain, cats kill 4.5 million birds a year, while Magpies kill 1.1 million. In city suburbs, cats are much commoner than Magpies. In suburban Britain, there are about 25 cats to every Magpie territory - and the 25 cats kill about 400 birds in total every year.

Of course, our garden birds have had to devise methods of survival against the Magpie, and many songbirds live for several years and raise large clutches. Some have several broods each year, so there is always a surplus of young birds for Sparrowhawks and Magpies to exploit. For each pair of adult songbirds, only two chicks need survive to breeding age to replace the parents. This means that some species can lose over thirty of their offspring during their lifetime and the population will still remain stable! The Magpie even has its own natural predator, namely the Hooded Crow, which takes its eggs and kills its young. Even adult Magpies are sometimes killed by Hooded Crows.

In nature, predator and prey numbers are always in balance, so predators never exceed prey - otherwise they would starve! Predators keep down prey numbers so they don't exceed what their habitat can support. Hence songbirds always outnumber Sparrowhawks and Magpies, and Magpies always outnumber Hooded Crows.

Although not often heard, the Magpie has a very pleasant twittering song which is often overlooked as it is very quiet compared to its loud 'rattle' calls. During spring pairs of Magpies can regularly be seen carrying sticks to their selected nest site, usually high up in a tree. There, over a period of days, they will construct their large domed nest and line it with mud and fine grass. After an elaborate mating ritual involving much displaying, 'tail-wagging' and presenting of food offerings by the male, the female will lay 3-5 whitish eggs which she incubates for 18 days. The young are then fed in the nest for a further 24 days. After leaving the nest they will stay with their parents for a further six weeks. There are over 80,000 pairs of Magpies in Ireland, and although their numbers appear stable in the countryside they are increasing in urban areas as they learn to take advantage of the food supplies there, such as waste bins

Magpies are as much a part of our birdlife as Robins. So, next time you see one, watch it for what it is, a beautiful member of the crow family.

The Robin

MANY of the Christmas cards we receive have a Robin on them. Despite being one of our best known birds, the lifestyle of the Robin is often full of surprises!

The Robin is one of our commonest birds; it seems to be everywhere, with over one and a half million pairs of Robins breeding in Ireland and many thousands more arriving in the autumn to spend the winter with us. Although the Robin is resident in Ireland, staying in the same place all year round, in some other countries they are migratory and many of the Robins we see in the winter will have come from either Scandinavia or continental Europe.

A regular garden bird, the Robin is a frequent visitor to the bird table. Unlike finches and sparrows the Robin is not a seed eater. Their preferred food is worms, grubs and insect larvae, but they will take crumbs and grated cheese or fat from the bird table. Some Robins have even learnt to feed from people's hands especially when a tasty titbit such as a mealworm is the reward. Always the gardener's friend, the Robin often perches on a spade handle. However it is not friendship that they have in mind but the worms that are being dug up with each spadeful!

Robins are very faithful birds and mate for life, with both birds sharing the same territory for their lifetime. During the spring the male Robin becomes extremely aggressive and will attack anything red in his territory – try sticking a bunch of red feathers in a nearby tree and see what happens! The nest is often located in an old shed or outdoor building and is made of moss and soft grasses. You can always put up a nestbox to attract them in or simply use an old kettle placed low down in a hedge – make sure the spout points downward so it doesn't fill with water! The 4-5 white and red speckled eggs hatch after about 13 days and the young leave the nest after a further 13 days but are still dependant on their parents for a another two weeks. Most pairs will rear a second brood, and occasionally a third!

With all these youngsters arriving, it would appear that the countryside should be over-run with Robins, but most have a very short lifespan. 90% of young Robins will die in their first year and the remainder usually don't live for more than 2-3 years. Occasional individuals can live for much longer, with some birds living until their 'teens. Losses are usually due to cats, Magpies, Sparrowhawks and the harsh winter weather.

The Robin is one of our best songsters and can be heard singing in our gardens all year round. However he doesn't sing the same song all year. During the winter months the song changes from the familiar lively spring song to a slower, more melancholy winter song. This mellow air can be heard right in the depths of the winter, even when there is snow on the ground. In built-up areas Robins often sing at night under street-lamps or near brightly lit houses. As a result, many people think we have Nightingales in Ireland, though these renowned song birds are only very rare visitors to this country.

The following leaflets can be downloaded from the ***BirdWatch Ireland*** Website:

Feeding Garden Birds
Gardening for Birds

Simply go to **www.birdwatchireland.ie** and click on 'downloads' They are filled with information on foods to put out and plants to grow that will attract birds to your garden.

Bird Quiz

Name three species of thrush which you can attract to your garden. 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, Co. Cork.

BirdWatch Ireland **run the Garden Birdwatch survey each year from December to February. It is great fun and helps teach you about all the different birds that come to your garden. Full details of the survey, as well as a survey form, can be downloaded from the *BirdWatch Ireland* website. A selection of birdfeeders, books and many other items can also be purchased online at the *BirdWatch Ireland* website.**

Join Birdwatch Ireland at www.birdwatchireland.ie

Seared Trout with Tomato Coulis & Garlic Vinaigrette

Ingredients

- 4 x 170g / 6oz fillets of trout
- Salt and freshly milled black pepper
- Olive oil

Method

Heat 2 tablespoons oil in frying pan. Season trout and quickly sear/fry trout for 3 minutes each side. Remove.

Tomato Coulis

- 4 tomatoes - skinned, seeded and blended
- 25g / 1oz butter - diced
- Pinch castor sugar

Cook tomatoes for 3 minutes.
Continue to cook, adding diced butter little by little.
Season and add a pinch of sugar.

Garlic Vinaigrette

- 2 tablespoons olive oil
- 2 cloves garlic - crushed
- 1 tablespoon white wine vinegar
- 2 tablespoons cold water
- Juice of half lemon
- 4 tablespoons very finely chopped onion and courgette
- Chopped thyme and fennel
- 1 bay leaf

In a small saucepan mix all ingredients except onion, courgette and herbs.
Boil for 30 seconds and then remove from heat and allow to infuse for 10 minutes.
Strain, check taste and add onion, courgette, thyme and fennel.

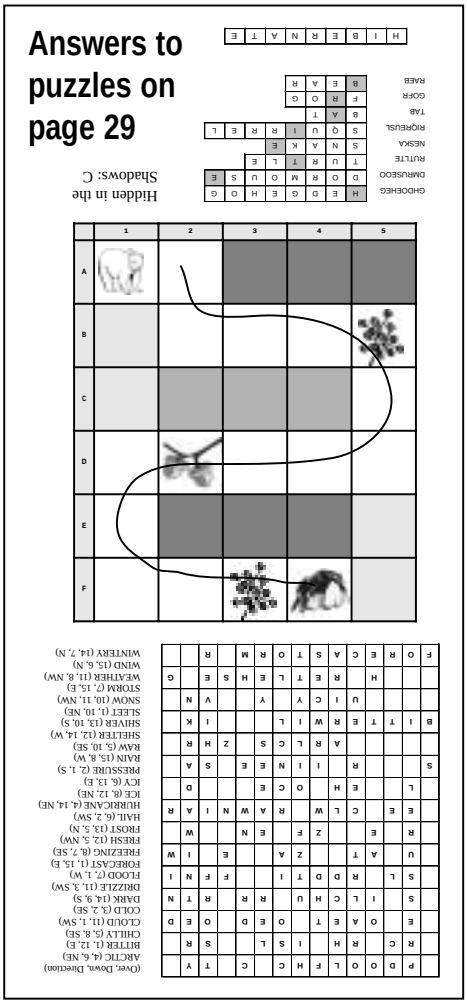
To Serve

Arrange trout on hot plates and surround with tomato coulis and vinaigrette.
Serves 4.

Fish alternatives - salmon, arctic char.

Photo: © BIM

Answers to puzzles on page 29



WINTER SLEEP

HIBERATION, or winter sleep, is a way for animals to avoid the hardship of looking for food during winter. They just go into a deep sleep until the warmer weather arrives and food is plentiful again.

The dormouse is a good example of a hiberating mammal. It eats so much during the autumn months that it becomes very fat in a short time. When the air temperature drops below a certain level the dormouse curls itself into a tight ball and falls asleep in a nest it has made. It will sleep there until temperatures rise again, living all the while on the fat in its body.

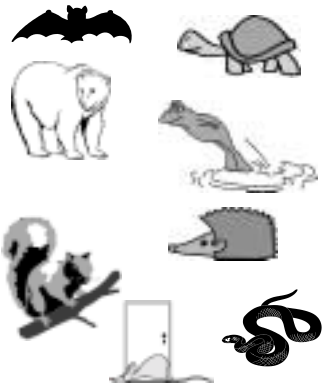
While asleep an animal that truly "hibernates" drops its body temperature, reduces its breathing and lowers its heartbeat. Because so little energy is being used, the store of fat in the body is absorbed very slowly. Once the warmer weather of spring arrives, the animal wakes up, much thinner but not weak and is ready to start breeding.

The winter sleep for all animals that are said to hibernate are not the same. Some may just sleep more than usual, others might wake up briefly during the winter months. Many cold-blooded animals such as frogs, toads and snakes, are also said to hibernate, but not in the same way as mammals.

Hibernating animals include the dormouse, hedgehog, bat, bear, snake, frog, toad and squirrel.

Hidden in the Shadows

The squirrel is jumping from branch to branch in search of nuts. Can you identify the correct shadow?

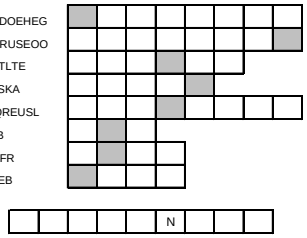


GOODNIGHT!

With the help of the pictures above unscramble the words below, fitting them into the grids. Use the highlighted letters to solve the hidden word.

Clue: Zzzz Zzzz Zzzz Zzzz

GHDOEHEG
DMRUSEOO
RUTLTE
NESKA
RIQREUSL
TAB
GOFR
RAEB



N

Winter Weather

C	P	D	O	O	L	F	H	C	D	C	O	T	Y	D
N	R	C	W	R	H	O	I	S	L	Y	B	S	R	S
V	E	V	O	A	E	T	I	O	E	D	D	O	E	D
C	S	P	I	L	C	H	U	T	R	R	F	R	T	N
H	S	L	D	R	D	D	T	I	Z	D	F	F	N	I
R	U	L	A	T	S	I	Z	A	G	M	E	M	I	W
L	R	D	E	Q	Y	Z	F	R	E	N	P	X	W	K
Q	E	E	Z	C	L	W	B	R	A	W	N	I	A	R
I	L	C	E	E	H	H	O	C	E	N	B	A	D	U
S	D	H	I	R	Z	I	I	N	E	E	F	S	A	X
V	P	M	H	N	A	R	L	C	S	I	Z	H	R	C
B	I	T	T	E	R	W	I	L	D	G	M	I	K	Y
Z	P	C	G	U	I	C	Y	S	Y	W	C	V	N	Z
O	N	A	H	A	R	E	T	L	E	H	S	E	E	G
F	O	R	E	C	A	S	T	O	R	M	O	R	K	J

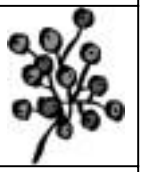
ARCTIC
BITTER
CHILLY
CLOUD
COLD
DARK
DRIZZLE
FLOOD
FORECAST
FREEZING
FRESH
FROST
HAIL
HURRICANE
ICE
ICY
PRESSURE
RAIN
RAW
SHELTER
SHIVER
SLEET
SNOW
STORM
WEATHER
WIND
WINTERY

HIBERNATION TRAIL

It is hard for the bear to find food during the cold winter months so it will hibernate for the winter. Can you follow the instructions to bring it safely to the cave where it will find shelter? Help the bear collect berries and nuts along the way to build up its body weight. This stored energy will help it survive during the long, cold winter.

Column 1, Row B&C = thick forest; colour the squares green
Column 2-4, Row C = cliff edge; colour the squares black
Column 3-5, Row A = deep river; colour the squares blue
Column 2-4, Row E = mud slide; colour the squares brown
Column 5, Row E-F = large boulders; colour the squares grey

When you have coloured in all the obstacles, draw a path to the cave.

	1	2	3	4	5
A					
B					
C					
D					
E					
F					

"Still Smiling"

The President's Award Army Survival Course

Photos: © Stephen Peers

Claire Costigan from Glasnevin in Dublin, with Sgt. Richard Deegan of the 2nd Field Artillery Regiment of The Defence Forces.

ON a four-day army survival training programme on the Wicklow Mountains jointly organised by The President's Award – Gaisce and the 2nd Field Artillery Regiment of The Defence Forces. Twenty-six participants from all over Ireland were selected for this gruelling four-day event.

The President's Award is the national challenge award from The President of Ireland to young people between 15 and 25 years of age. The award has increased in popularity with almost 9,000 (nine thousand young people) entering for the Award in the past year. Almost half of those who enter for the award eventually succeed in earning an award.

By Claire Costigan

A COUPLE of months ago while looking up information for my Bronze Award on the President's Award website I noticed an offer for an Army Survival Course in Wicklow. Falling off mountains and other near misses seemed strangely familiar so I decided to apply. Amazingly I was chosen. That is why on Tuesday 1st July at 10 00 hrs 26 Gaisce participants from Derry to Kerry traded our creature comforts for four days to undertake whatever challenges the 2nd Field Artillery Regiment of the Army decided to throw at us. We met at McKee Barracks, waved goodbye to civilisation and embarked on an incredible journey. From the moment we arrived we were made feel welcome. We turned in our civvies and donned the Army Khaki. We were given our lunch and no one can say that they left the barracks on an empty stomach. The 26 of us aged from 15-19 years were divided into teams and each team was assigned a team leader. For the next four days we set up camp together and whatever challenges had to be faced we undertook them as a team.

After being togged out in our Khaki clothes, our faces resembling masterpieces (green is definitely my colour) we were loaded onto the army trucks ready to begin our adventure in Wicklow. Our first task as a team was to canoe across a lake to find our rations – our daily rations included two cooked meals; breakfast and dinner and snacks for in between. After canoeing we jumped back on the trucks and headed to the forests to set up camp.

Everyday brought new and exciting challenges. Try to imagine being woken at 6.30am, taking down our tents then wolfing some breakfast. Next we started a five-hour hike over a rocky terrain followed by an abseil down pure rock face near Glendalough. The next task was to cross the river from a towering precipice using three different methods one involving lying on the rope on your belly and pulling yourself to the other side. Indiana Jones eat your heart out. The fun continued into the night where anyone of these activities could be on the agenda – raft building, orienteering and lots more.

This was no ordinary trip where there would be just one highlight. Each day brought new experiences but what made this trip so memorable were the people. Everyone that took part from the participants to army and Gaisce personnel had a great attitude. Team spirit and mutual support and good humour were the key ingredients. For my part I loved it all from waking up in the morning and seeing the trees silhouette towering over me to trying new activities and most of all seeing people at their best and doing what they love.

Because of the constant variety of activities it was easy perhaps too easy to forget the people who made this all happen.

The Army's planned activities and the Gaisce personnel's encouragement and support combined to make this a really great experience. The motto of the trip was "Still smiling" and for the most part we were.

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

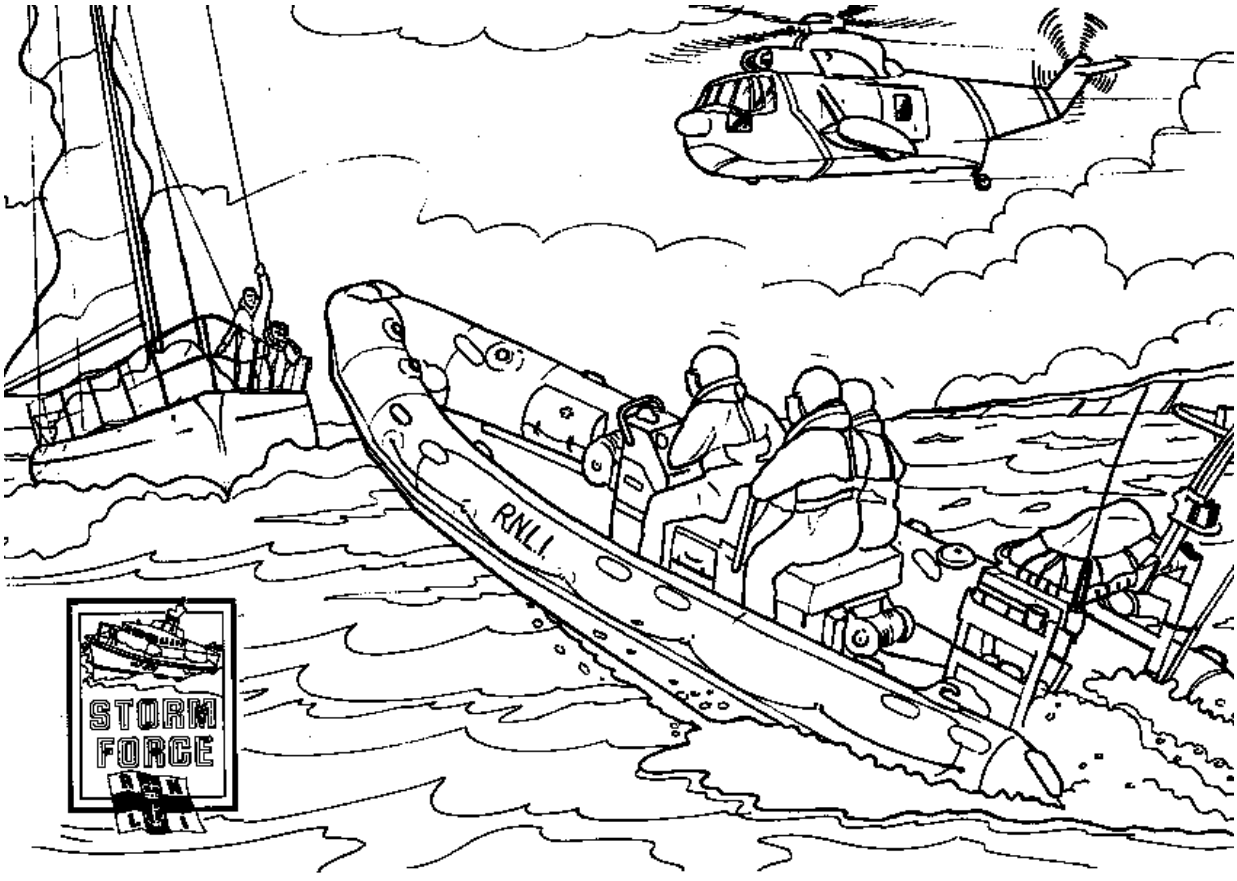
Part of the course involved a five-hour hike over a rocky terrain followed by an abseil down pure rock face near Glendalough.

The Northern Lights

THE northern lights are a dazzling display of coloured light, sometimes seen in the night sky of the northern hemisphere. Similar displays occur in the night sky of the southern hemisphere. Scientists call these lights *aurora*, with the northern lights known as *aurora borealis* and the southern lights known as *aurora australis*.

These lights move across the sky in the form of luminous arcs, sometimes flashing like giant searchlights. These displays are caused by huge explosions, called flares, on the sun. When these flares take place they throw huge quantities of solar particles into space. Travelling at over a million kilometres per hour, these clouds of particles can reach Earth within two to three days. As they close in on Earth, the Earth's magnetic field captures the particles and guides them towards our two magnetic poles, the geomagnetic north pole and geomagnetic south pole. On the way to the poles, the particles collide with the Earth's atmosphere, which acts as a shield. This collision causes the particles to send out light, which result in fantastic displays in the night sky.

The northern lights are best viewed from northern Canada, northern Scotland and northern Norway and Sweden, but sometimes the lights can be seen as far south as Ireland, as shown in these photographs taken on Sherkin Island, Co. Cork, this November.



Reproduced from "Storm Force" the RNLI's club magazine.

Colour the RNLI Rescue

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:
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Dun Laoghaire,
Co. Dublin.
Tel: (01) 2845050
Fax: (01) 2845052
Email:
info@rnli.org.uk
Web: www.rnli.org.uk

Sherkin Island Marine Station Environmental Competition

for Primary School Children in Munster 2003

THE response to Sherkin Island Marine Station's Environmental Competition for Primary School Children in Munster for 2003 was wonderful. We were delighted to have Cllr. John Mulvihill, Deputy Mayor of Cork County, presenting the prizes at the prizegiving ceremony at the Carrigaline Court Hotel, Carrigaline, Co. Cork.

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:* Our Lady of Mercy Convent N.S., Bantry, Co. Cork.**
Cllr. John Mulvihill, Deputy Mayor of Cork County presenting the prizes at the Carrigaline Court Hotel, Carrigaline, Co. Cork. Also present are Mr. Paul Bourke, Central Fisheries Board; Mr. Bob Cooke, BIM; Mr. Jim Murphy, Janssen Pharmaceutical Ltd. and Mr. Matt Murphy, Sherkin Island Marine Station.

***Above:* Kildimo N.S., Kildimo, Co. Limerick.**
Cllr. John Mulvihill, Deputy Mayor of Cork County presenting the prizes at the Carrigaline Court Hotel, Carrigaline, Co. Cork. Also present are Mr. Paul Bourke, Central Fisheries Board; Mr. Bob Cooke, BIM; Ms. Niamh Hunt, Janssen Pharmaceutical Ltd.; Mr. Eddie O'Sullivan, Pfizer Ireland Pharmaceuticals; Mr. Matt Murphy, Sherkin Island Marine Station and Ms. Lynne Morrissey, Cork County Council.

***Above:* Banogue N.S., Banogue, Croom, Co. Limerick.**
Cllr. John Mulvihill, Deputy Mayor of Cork County presenting the prizes at the Carrigaline Court Hotel, Carrigaline, Co. Cork. Also present are Mr. Paul Bourke, Central Fisheries Board, Mr. Bob Cooke, BIM, Mr. Jim Murphy, Janssen Pharmaceutical Ltd.; Ms. Lynne Morrissey, Cork County Council and Mr. Matt Murphy, Sherkin Island Marine Station.

***Above:* Scoil Iosagain, Aghada, Midleton, Co. Cork.**
Cllr. John Mulvihill, Deputy Mayor of Cork County presenting the prizes at the Carrigaline Court Hotel, Carrigaline, Co. Cork. Also present are Mr. Paul Bourke, Central Fisheries Board; Mr. Bob Cooke, BIM; Ms. Niamh Hunt, Janssen Pharmaceutical Ltd., Ms. Lynne Morrissey, Cork County Council; Mr. Eddie O'Sullivan, Pfizer Ireland Pharmaceuticals and Mr. Matt Murphy, Sherkin Island Marine Station.

***Above:* St Mochulla's N.S., Tulla, Co. Clare.**
Cllr. John Mulvihill, Deputy Mayor of Cork County presenting the prizes at the Carrigaline Court Hotel, Carrigaline, Co. Cork. Also present are Mr. Paul Bourke, Central Fisheries Board; Mr. Bob Cooke, BIM; Mr. Jim Murphy, Janssen Pharmaceutical Ltd.; Ms. Lynne Morrissey, Cork County Council and Mr. Matt Murphy, Sherkin Island Marine Station.