

# SHERKIN COMMENT

Issue No. 43

Environmental Quarterly of Sherkin Island Marine Station

2007

**Gibraltar's Haven for Nature**

*The rich flora and fauna of this limestone mountain are outlined by John Akeroyd. 6*

**Steering a New Course**

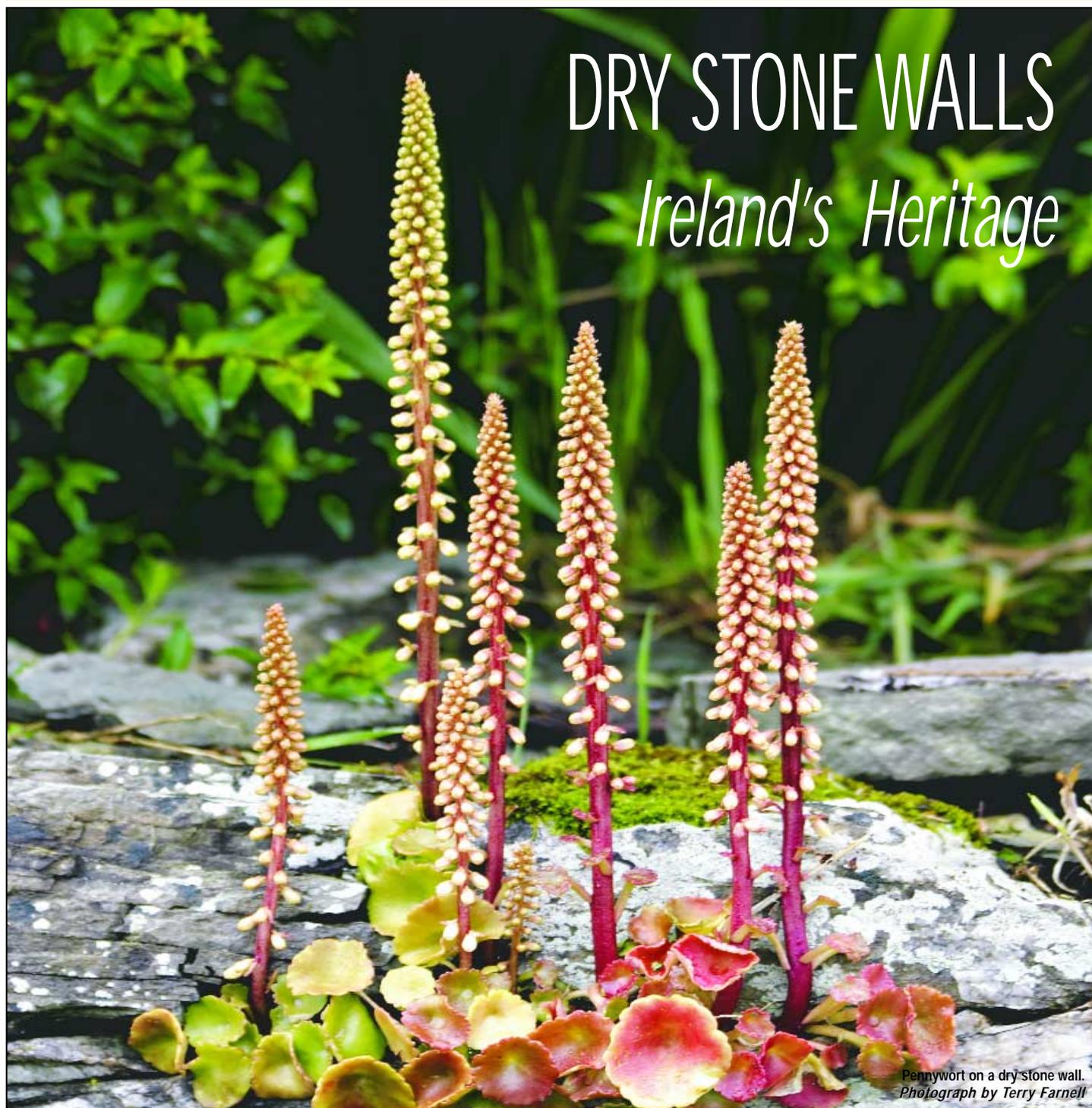
*Matt Murphy summarises the findings of the Seafood Strategy Group. 13*

**Wild Melbourne**

*Anthony Toole on the work being carried out to protect wildlife near the city of Melbourne. 23*

**"Trout in the Classroom"**

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## DRY STONE WALLS *Ireland's Heritage*

Pennywort on a dry stone wall.  
Photograph by Terry Farnell

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## Editorial

# A New Beginning for the Seafood Industry?

By Matt Murphy

IN the summer of 2006 the Minister of Communications, Marine & Natural Resources, Mr. Noel Dempsey, TD, and the Minister of State, Mr. John Brown TD, announced an independent Strategy Group to make proposals for the development of a comprehensive integrated-led vision for the future of the Irish Seafood industry.

Dr. Noel Cawley, former Chief Executive of the Irish Dairy Board was appointed Chairman of the Review Group and the other members were Mr. Joey Murrin, for many years a major spokesman for the fishing industry and Mr. Ruan O Bric, former Chief Executive, Udaras na Gaeltachta. This proved to be the ideal mix as each had different expertise to offer.

The Strategy Group held four regional meetings in Donegal, Galway, Kerry and Water to meet stakeholders. Apart from the public consultation meetings the Strategy Group met on 21 occasions over the period of the review, which ran from July to November 2006. A number of those meetings were with the CEOs of the four major fishing organisations in the Republic. The outcome of the review was the publishing of the report "Steering a New Course".

The most extraordinary aspect of the report is the publication of summaries of the submissions and issues raised at the regional meetings. They show the depth of interest and at times frustration that stakeholders feel. There is no doubt that people wanted the Strategy Group to understand the problems that the seafood industry is encountering.

The Strategy Group's report is the most important analysis of the seafood industry ever undertaken because the Group consulted widely and above all has listened. If its recommendations are not brought to fruition then the industry will die in a very short time. Already we have seen the number of people in processing reduced by over 600 people between 2000 and 2005.

Twelve years ago there were up to 70 vessels landing into the port of Castletownbere. With the whitefish renewal programme and decommissioning this number is now close to 20. This reduction has a knock on effect in the town and its surrounding areas. Castletownbere is but one port effected by overfishing and lack of conservation regulations at the fishing grounds.

Much has been made of Irish fishermen fishing above their quota - which must be condemned; but what about the Dutch, French, Spanish and other vessels fishing in our waters? They also overfish, but who is checking on them? Until they too are reined in, all the conservation regulations in the world will not see our fishing water protected and our fish stocks recover.

The most important recommendation of

the Strategy Group is that a committee under the Chairmanship of the Department of Communications, Marine and Natural Resources be established to coordinate state support for the industry. Minister Dempsey has gone further; he has asked Dr. Cawley to accept the Government's request to Chair a high level group to oversee the implementation of all the recommendations set out in the report. This decision is of immense importance. It will mean the report will not gather dust on some shelf. Dr. Cawley accepted on condition that he got a separate secretariat, a request that the Minister agreed to. All stakeholders including state institutions and semi-state bodies must understand one thing. Dr. Cawley has an immense record for delivering when at the Irish Dairy Board. He will, I believe, do the same for the seafood industry and will not be fobbed off by anyone.

It is to be hoped that the Producers Organisations representing fishermen will continue to consolidate. They have already formed a Federation of Fishermen with a rotating chairman for six months from each of the four producers group CEOs. Frankly this is not enough. They must amalgamate the four Producers Organisations, coming together with one voice for the future of the fishing industry. It is important to encompass all those fishing offshore and especially inshore. Let us not forget that the inshore fleet comprises of 1,360 vessels of less than 12 metres, giving employment to over 2,300 people. Sadly few are members of any of the Producers Organisations. They must realise that they cannot expect to achieve change without leadership and unity.

The Strategy Group highlights that the landings by Irish trawlers of fish in foreign ports in 2000 were 75,679 tons against 114,168 tonnes in 2005. This needs addressing to see if much of this tonnage can be landed in Ireland, resulting in extra employment on shore.

The pelagic fleet of vessels gets a mention but the Strategy Group did not make any recommendations except to state that it needs restructuring, with the introduction of a quota management system etc.. However it is believed the real reason it was not addressed is that the compensation required to decommission a number of these vessels would be too costly to the State.

The Strategy Group sees the huge potential for aquaculture and this is confirmed by Government who will invest over €100 million into the development of the industry. There is much wrong in the industry - the burden of regulations and in particular the licence regime. However the report give very positive reasons as to why this industry, which is worth €100 million annually should be developed more and it makes recommendations for change.

What we in Ireland have failed to realise is that 50% of fish production worldwide is now from aquaculture. We have failed to utilise the excellent quality of the waters around our coasts. We have

a salmon industry that has never taken off. We should be farming 50-60,000 tonnes instead of 12-14,000 tonnes. Why? We have also invested much research funding into turbot, sea urchins and abalone and our success could be written on a postage stamp. The only bright lights are mussels and oysters. And the former is already under huge pressure from Chile where production of mussels is over 180,000 tonnes and will be up to 320,000 tonnes plus by 2010. They are now selling into the EU markets, along with the Irish aquaculture industry.

The Strategy Group made suggestions on the need for research into fish stocks etc.. However they did not elaborate. Surely the time has come to have a similar report on marine research in Ireland. The same team who masterminded the Strategy Group Report should carry this out, because they now understand the needs of the industry. At present over 20 Irish institutions receive more than €60 million annually for research in the marine environment. It is interesting to note that only two of these made submissions to the Strategy Group.

On page 12 and 13 we have set out some of the main recommendations of the Strategy Group. I want to stress that the Irish Seafood Industry should be incredibly thankful to Dr. Cawley, Mr. Murrin and Mr. O Bric for this in-depth Strategy Report. The government has accepted it in full and has committed over €334 million over the 2007-13 period for its development, which has to be a major boost to the industry. This is a golden opportunity for them and they will not get another one.

The industry cannot have all their demands met. They must compromise on some issues or else they will end up with nothing. The major issue hindering progress, which must be solved, is the distrust between the fishing industry and the Department of the Marine. If this is not sorted out then the Strategy Report can be put in the waste paper bin for recycling. Maybe the kernel of this problem is that the Department of the Marine is underfunded and thus understaffed.

Dr. Cawley stated at one of the Regional meetings that in his years with the Irish Dairy Board the farming community and the Department of Agriculture had their differences but had a united front in Europe when the chips were down. Let us hope his comments have not been brushed under the carpet and are taken on board by all sides involved in the Seafood Industry.

On rare occasions in life we hear when some individual dies "His or her likes will not come again". We will not have a report produced by a Strategy Group with such clarity and depth again because if its recommendations are not carried out there will be no industry left to report on.

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

By Oscar Merne

IN Parts I and II of this short series on the seabirds of New Zealand I wrote about the penguins and pelagic seabirds (albatrosses, petrels, shearwaters, etc.) of the southern ocean, for which New Zealand and its associated islands are a world headquarters. In this third and final article on New Zealand's seabirds I cover the remaining groups of seabirds – the Australasian Gannet, the cormorants and shags (all called shags down there), and the gulls and terns.

The Australasian Gannet is very similar to our Northern Gannet in appearance, and indeed it is also very similar to the Cape Gannet of Southern Africa. The adults of the Northern Gannet have white wings with a black tip and an all-white tail; the Cape Gannet has a black trailing edge to its wings and a black tail, while the Australasian species differs from the Cape Gannet by having white edges to its black tail. The Australasian Gannet breeds in New Zealand and on islands off Tasmania and roams the adjacent seas.

In New Zealand there are about a dozen breeding colonies, mainly on islands off North Island. Most of these are difficult to get to, but happily for us there are also two large mainland colonies. With limited time, we decided to visit the mainland colony at Muriwai Beach, which is on the western coast of North Island, less than an hour's drive from central Auckland. There's a car park and picnic area at the south end of the beach and from there it's a short walk along a cliff path to a rocky headland and stacks where the Gannets are located. The colony is situated on a couple of mainland promontories and stacks and islands a little distance offshore. The mainland sections are reached by paths to viewing platforms, and in one place the Gannets sit quietly on their nests within a couple of metres of a viewing platform, seemingly quite unperturbed by the comings and goings of the human visitors. Here you can spend as little or as much time as you like observing the breeding activities of the dense colony, taking photographs, and gazing at the vastness of the Tasman Sea and the wonderful wilderness of the coastal



Left: A view of part of the Australasian Gannet colony at Muriwai, North Island. Below: A group of Black-billed Gulls inland on South Island.

# Seabirds Down Under

## Part III



Above: A Red-billed Gull on its nest. Below: A group of Black-billed Gulls inland on South Island.



Photos © Oscar Merne

beaches and headlands. When we were there, in late November, it was the middle of the breeding season and we could see all stages of the nesting cycle – courtship, nest building, incubation of eggs, feeding of chicks, and chicks at various stages of development from little naked and blind black things to large balls of snow-white down.

Here in Ireland we have Great Cormorants and Shags, but in New Zealand there are seven species on the three main islands – Great Cormorants (the same species as ours), Little Black Cormorants, Pied Cormorants, Little Pied Cormorants, New Zealand King Cormorants, Stewart Island Cormorants, and Spotted Shags. On islands away from the three main islands of New Zealand there are an additional four endemic cormorants – Chatham Island, Campbell Island, Auckland Island, and Bounty Island Cormorants. We didn't manage to get to any of these far-flung islands, so failed to see any of the birds endemic to them. However, on North and South Islands we did encounter all seven species found there, three of which (New Zealand King Cormorant, Stewart Island Cormorant, and Spotted Shag) are endemic to New Zealand. Great Cormorants and Little Black Cormorants could be found nesting in trees on lake islands, while the others were mainly on coastal cliffs and headlands. The New Zealand King Cormorant is confined to the Queen Charlotte Sound at the north end of South Island, a 20 km fjord from which the inter-island ferry sails to Wellington. We went out on a dolphin-watching boat from Picton, but unfortunately could not get to the island at the mouth of the sound where the King Cormorants nest, due to rough seas. However, within the sound we had a brief view of one King Cormorant flying in and fishing.

Somewhat surprisingly, for an area with such a huge diversity of seabirds, New Zealand has only three gull species – Kelp (or Black-backed) Gull, Red-billed (or Silver) Gull, and Black-billed Gull. The Kelp Gull is rather similar to our Great Black-backed Gull and is found in the temperate and sub-Antarctic zones of the southern hemisphere; the Red-billed Gull is very common all around Australia and New Zealand. The Black-billed Gull is a New

Zealand endemic, and is found mainly inland, while the similar Red-billed Gull is mainly a coastal species. All three species are common, and the two smaller ones are often quite tame.

Five species of terns breed in New Zealand. The Caspian Tern is found on the coasts of the main islands, and is also widely distributed in North and Central America, Africa, Eurasia and Australia. The Antarctic Tern breeds on islands south of South Island, and also on remote islands in the South Atlantic and southern Indian Oceans. In New Zealand the little white Fairy Tern is restricted to the northern peninsula and islands of North Island, and is also found on the coasts of Western and South Australia, Victoria, Tasmania and New Caledonia. White-fronted Terns are the most numerous terns on the New Zealand coast and are endemic to the region. In winter they wander as far as south-east Australia. The Black-fronted Tern is a New Zealand endemic and is confined to the South Island, where it is closely associated with the enormous gravel outwash plains and braided rivers east of the Southern Alps. We saw all these terns on our visit to New Zealand, although we ran out of time and were not able to explore the northern peninsula of North Island.

So, if you enjoy watching seabirds, New Zealand is the place to go, for its huge diversity of seabird species, its many endemics, spectacular colonies, and the wonderful experience of seeing albatrosses at one or two metres range off Kaikoura.

*Oscar Merne retired from Ireland's National Parks & Wildlife Service in January 2004*



A Pied Cormorant drying its wings.

# Air Pollution

## Threat to our Built Heritage

By Paul McMahon

ATMOSPHERIC pollution is now recognised as a global problem, and since the 1980s UNESCO has voiced its concern about the accelerating deterioration of the world's architectural heritage due to the impact of acid rain.

For many countries, including Ireland, whose tourist industries are based around their historical monuments this heritage represents a major economic resource

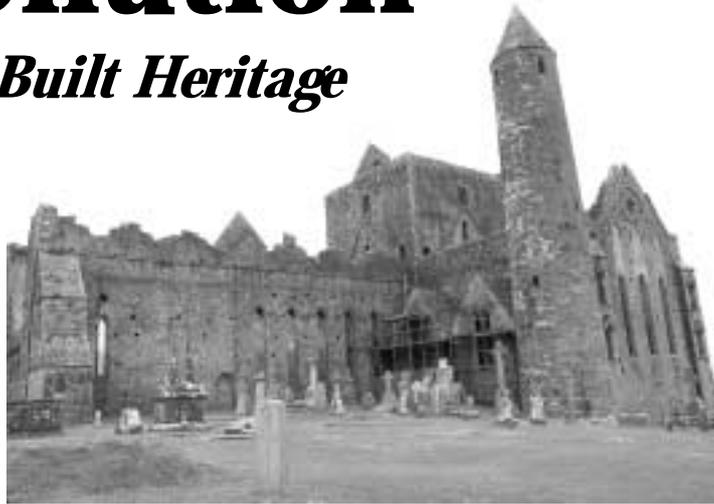
It is also now estimated that more than half of the financial capital of each European country is presently tied up in its building stock. There is Government commitment to sustainable development by encouraging the use, re-use, and maintenance of the existing building stock so that those buildings which have been in use for many decades, or even centuries, will continue in use for years to come.

The provisions in the Planning and Development Act 2000 for the protection of the architectural heritage reinforces this commitment.

Conserving buildings depends on having a detailed knowledge of the environmental threats that exist, the ways different materials react to them, and the various techniques that exist to counteract damage. Accurate data on the buildings history, the materials and techniques used and what, if any, repair work has been carried out, is essential.

### Rate of Decay

Many of today's air pollutants form acids when in contact with atmospheric water; some of these acids are strong (e.g. sulphuric and



Much of the world's architectural heritage is under threat from atmospheric pollution.

nitric) while others are weak (e.g. carbonic). It is easy to prove that the presence of corrosive acids causes an increase in the rate of chemical attack on a range of building materials. Many traditional building materials including iron and stone, such as limestone and sandstone, with a high calcium content, such as are susceptible. Modern building materials like concrete and steel can also be affected.

Unfortunately chemical attack is only one of various processes involved in the deterioration of porous and brittle materials which constitute the large majority of the exposed surfaces in our historic building stock. Processes that are mostly physical or mechanical in character (thermal expansion, water absorption, frost) are always active, independent of air pollution. It is therefore not possible to establish general mathematical damage functions for these materials, correlating rate of damage directly to

pollutant concentration.

As an example of the complexity involved in evaluation of decay rates we can note that a single stone might have different surface features depending on its history.

A wide range of climatic and technological factors (e.g. climate, carving, mechanical cleaning, structural loading) can cause surface failure and exposure to acid attack.

These surface features constitute the "memory" that the material retains of its previous experience and which has a great influence on its future behaviour.

In other words it may be said that the rate of decay is higher for materials which have a history of natural deterioration or surface damage caused by people.

### Conservation Policy

A conservation policy for historic building materials in a polluted environment may be established following two different approaches:

- Reduction of the climatic aggression including air pollution
- Improvement of maintenance practises

### Reduction of the pollution level

The evidence collected to date indicates that, among the various pollutants, there is definitive proof of the influence on the deterioration process for sulphur oxides and the sulphuric acids they form. Attacks by this acid result in the formation of a black gypsum crust which are frequently found on the decayed surface of many of our heritage buildings. Due to the obvious and ugly visual effect of this "stone cancer" the less obvious effects of nitrogen emissions and naturally occurring carbon has often been neglected in the discussion on conservation policies.

In the case of nitrogen oxides recent research indicates that decay originates from biological processes (penetration of waste water or production of decay agents by bacteria). The impact of carbonic acid, while considered slower, can still be found on deteriorated surfaces.

A further complication is produced by the fact that the pollutant may be brought onto the surface by wet deposition (acid rain) or dry deposition (aerosols and dew).

Different symptoms and rates of decay are produced by both (e.g. white eroded surfaces are formed on limestone by wet deposition and black crusts by dry deposition, involving mainly sheltered surfaces and local pollutant sources).

High concentrations of air pollution undoubtedly cause an increase in the decay rates of vulnerable historic building materials. Everybody agrees that the high oxide concentrations existing today must be reduced anyway because of the risk to human health and vegetation. When, however, an improved situation is reached in which, say, 80% of the Sulphur Dioxide has been removed (as in Dublin after the Clean Air Act) it is more difficult, and I would suggest perhaps not practical, to prove the case for further reduction.

Furthermore, one cannot say that if, for example, the sulphur dioxide concentration goes down to zero, the maintenance cost of our built heritage will also drop dramatically. As mentioned earlier, other deterioration processes exist, and, because of the "memory" factor, materials which have a past history of decay tend to undergo faster decay in the future. Actually it is in the protection of our new building stock that we could expect the largest economies.

### Improvement of maintenance practises

Reduction of air pollution is not the only type of environmental control which may improve the conservation of historic building materials. Provisions aimed at reducing the impact of temperature variations, frost, moisture and other agents of decay are also of great importance. These measures, however, cannot be applied on the global scale of a region or a town, as in the case with air pollution, but only to a single building complex or the vulnerable parts of that complex.

They can therefore be classified as architectural provisions, as they coincide with the correct conservation practise derived from experience in the performance of historic building construction. The establishment of a preventive maintenance regime for a heritage property will identify the potential threats to the building. Where aggressive airborne acids are deposited on the structure's surface appropriate cleaning methods and protective measures can be put in place. Protective measures can range from the simple, but often neglected, clearing of gutters, the use of modern technological interventions or the removal or sheltering of vulnerable material for its long term survival.

### Conclusion

Conserving our built heritage depends on having a detailed knowledge of the environmental threats that exist, the ways different materials react to them, and the various techniques that exist to counteract damage. Whilst salinity, humidity, industrial pollution and traffic exhausts will all play their part we must not jump to conclusions.

City buildings continue to deteriorate despite a decrease in sulphur deposits over the last two decades. The cause now appears to be a synergistic one between several different pollutants. To be effective we need to establish interdisciplinary expert research which should aim to produce reliable information on the real exposure conditions that Ireland's historic buildings face.

*Paul McMahon, Heritage Services, Office of Public Works, Dublin, Ireland. This paper was presented at the Sherkin Island Marine Station Annual Environmental Conference on "Air Pollution".*

## SUBSCRIPTION FORM

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**STAFF:** Editor, Matt Murphy; Editorial Assistant, Susan Murphy Wickens; Typesetting, Susan Murphy Wickens; Publisher, Matt Murphy. ISSN 0791–2447 © 2007 Sherkin Island Marine Station website: [www.sherkinmarine.ie](http://www.sherkinmarine.ie)

# “Them canoes is dangerous”

© Photo of Alanis, 2006



*“My dream is of an island place  
which distant seas keep lonely.  
A little island on whose face  
the stars are watchers only.”*

Elizabeth Barrett Browning

By Daphne Pochin Mould

A curragh on Inishbofin, Galway, Ireland. Curragh.

SPRING 1951, walking across Galway dock to board the venerable “Dun Aengus”, I passed the Cladagh’s still working fleet of Galway Hookers. These black hulled, red sailed and engineless boats carried Connemara turf for Aran Island fires, and general goods all around the coast. On Inishmore a “car” meant one horsepower, or one donkey - no internal combustion engine had yet arrived. A rag and stick vessel; a canoe would take me across the turbulent sea between Inishmore and Inishmann and it was rough. We watched the sea, and the woman of the house then said “them canoes is dangerous”. The men said “lets go, if we listened to the women we’d never

do anything”. So the little ship of wood and tarred flour bags was heaved into the sea and wafted us across to Innishmann, Dun Conor towered above the thatched cottage where Syngé stayed. Years later, I met an elderly man who remembered Syngé and looked forward to the completion of the island’s airstrip and going flying.

Syngé, Robin Flower, the islanders themselves, have made the canoe, the curragh into a wonder ship. Today enthusiasts build them a new and race them. Tim Severin built a skin boat, and took her across the Atlantic, the only such vessel ever to do so. Great credit to him and all his reconstructions of ancient vessels, but the skinboat is inshore and I was

very shocked in 2000, in an exhibition of Icelandic history to see the false statement that Irish monks came to Iceland in skin boats. In fact they came in good sturdy ships of Irish or Scottish wood.

The best selling story of Brendan’s voyage is a tale written centuries after this supposed event, and is part of the very ancient, pre Christian voyage romance form. Homer and Vergil both used the form, linking known places and events with an adventure story. Icebergs, undersea eruptions, whales, were all known at the time the Voyage romance was written. When Surtsey erupted off Iceland in November 1963, Icelandic geologists found the description of the island of demon smiths exactly

like Surtsey in the first explosive phase. Surtsey today is stabilised with its own lighthouse.

Further, in the legend, Brendan fails to find the Land of Promise and calls on his foster mother, St. Ita. Being a practical woman, she tells him the Land of Promise cannot be reached in a ship in whose building blood has been spilt. Back to wood and iron, and you can go anywhere.

The skin boat has been around for a very long time. The Eskimo kayak, of skins, sewn by the wife for her man, is perhaps the most seaworthy. You can do 360-degree rolls without taking water. For carrying cargo, the Inuit build an almost rectangular vessel of skins but it has to be dried out every two days. And the Inuit have nothing but sealskin to cover the framework of their vessels. They do not, could not, go trans-ocean.

How did boat building start? A floating log, just as a fallen tree may have given the idea of a bridge. Tie several together and you have a raft. Go further and hollow out your log, and you have the sturdy dugout canoe. Many turn up in our bogs and would be ideal for marsh and river travel. Today they are still widespread but with motors to push them along. A skin boat is very easy to tear if dragged over rough ground. When some years ago, a dugout came out of Cummeenatrush Lake, near Millstreet, Co. Cork, it was decided to conserve it in a trough of water some way off. The farm tractor was hitched to it and it bumped happily along over the rough moor without coming to harm. Remains of wooden, sea going Bronze Age ships have turned up in mudflats in Britain, even one loaded with bronze vessels for probable export. Ireland then was a ship builders dream with its great forests of oaks, and the Irish went trading over to Wales bringing back big cargoes of slaves, among whom was St. Patrick. They may even have gone as far as continental Europe. There was no way skin boats could do it; further the country had not the

resources to make them. It was cattle country, yes but leather was needed for hangings, clothes, shoes and horse harness and there was no chemist shop to supply drugs against insect damage. Tim Severin got the finest skin for his vessel, ancient Ireland would not have it. Consider too the trouble making a skin boat involves - you had to hunt your animal, kill it, skin it and cure the skin. Wood is so much easier.

The Gaelic word, corach, means just small boat. Sir Walter Scott who has a very good ear for dialect, had the Highlander tell the hero to wait for “Ta curragh” and when it arrived it was a big row boat with a sturdy crew of rowers. Adamnan’s life of Colmcille of Iona has a number of names for different types of small vessels, and using a Latinisation of what may be from Gaelic corach, tells they were towing logs to Iona for work on the monastery and ship building. It was hard rowing, the wind was against them and they asked the saint for help. The wind veered and they raised sail and sped on. No skin boat, keeless and light, could do such work. These were heavy enough tugs with masts and sails.

So don’t believe stories of saints in skin boats scudding around the islands. Or hermits, on such places as the Skellig for modern research puts all the hermits on the mainland in quiet places in wood and marsh, often today marked by the place-name desert. And what of the rag and stick boats of the west? The Blasket islanders had wooden boats, which were seized for rent, and they were forced to curraghs, which Dingle had just started using for lobstering. The western islands were very poor and making do was their way of life. Rag and stick needed very little timber, old flour bags and tar and you could go out to catch essential food. Yes, they were very good in wild seas in good hands but not so good that the riders to the sea might not return. “Them canoes is dangerous.”

**MATERIAL SORTING**

- Picking Line
- Primary granulation (25 mm)
- Metals separator
- 2nd stage over-band magnet

**MATERIAL SHREDDING**

- Shredder 225kW
- Vibrating sieve
- 1st stage over-band magnet
- Dust extraction

**MATERIAL REFINEMENT**

- Secondary granulation (sub 4 mm)
- Electrostatic separator

**MANUAL DISASSEMBLY**

- De-pollution
- Disassembly Line
- CRT processing facility

**SECURE DESTRUCTION**

- Data overwriting
- Data erasure
- Degaussing

Illustration of the Cedar WEEE recycling operation

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# GIBRALTAR'S *Haven for Nature*

By John  
Akeroyd

THE Mediterranean Sea has endured a long, exciting history. Evidence of more turbulent times is numerous castles and fortified towns on rocks, cliffs and islands along the coasts. One of the most striking of these ancient strongholds is the Rock of Gibraltar, a 1398-foot, isolated limestone mountain guarding the entrance to the Mediterranean from the Atlantic. Seized from Spain in 1704 by an Anglo-Dutch force and ceded to Britain by the 1713 Treaty of Utrecht, town and Rock remain a British enclave. Gibraltar is in fact an outgoing cosmopolitan place, a Mediterranean seaport home to a multi-racial mix of British, Spanish, Moroccans, Genoese and others, not least Irish (one street is still called Irishtown). The Moors were here longer than the Spaniards, and indeed gave Gibraltar its name – *Jebel al Tariq*, after the Tariq who captured the Rock in 711. A Moorish castle survives amid extensive 18th century British fortifications and barracks, which bear witness to determined French and Spanish sieges, notably the Great Siege of 1779–82. High on the Rock, gun batteries look out to sea, huge iron rings bear witness to cannon hauled up

to commanding positions and the limestone is riddled with defensive tunnels and galleries. For two centuries the harbour was a mighty naval base, invaluable during World War II.

The modern town, which in recent years has seen a frenzy of building, covers much of the western and northern sides of the Rock, but large areas of semi-natural vegetation and a remarkable range of habitats survive on the upper ridge, rocks and slopes, on the eastern sand-slope (a great prehistoric dune), and on cliffs here and there elsewhere. Planning is chaotic, property prices have gone through the roof, and poorly executed building projects encroach on surviving wild areas and their rich biodiversity. Yet, somehow, plants – some 600-plus native species – and animals persist and even thrive. The Upper Rock, a nature reserve, has fine stands of tall scrub and low woodland, dominated by characteristic Mediterranean trees and shrubs such as wild olive, buckthorn, lentisc, *Osyris*, dwarf fan-palm and brooms. Vigorous climbers such as *Smilax aspera*, wild madder, Mediterranean honeysuckle, and two elegant winter-flowerers, *Clematis cirrhosa* and an Andalusian endemic Dutchman's pipe (*Aristolochia baetica*), render dense vegetation quite impenetrable. Conversely, other habitats have all but disappeared, such as the sandy isthmus that links the Rock to Spain, destroyed by the construction of the airport; and residential and holiday developments creep down the east coast.

Several of the Rock's most characteristic animal and plant inhabitants are more typical of North Africa, less than 15 km to the south: the famous 'apes' or Barbary Macaques, Barbary Partridge (similar to Red-legged Partridge), and two hummocky perennial plants, Gibraltar Mouse-ear Chickweed (*Cerastium gibraltarium*) and the fleshy-leaved white or pink-flowered Gibraltar Candytuft (*Iberis gibraltaria*) occur nowhere else in Europe. A few choice plants occur nowhere else, especially the handsome pink-flowered Gibraltar Catchfly (*Silene tomentosa*), once



Lesser kestrel, *Falco naumanni*

thought extinct; also a striking sub-shrubby variant of Yellow Sticky Restharrow (*Ononis natrix* var. *ramosissima*), a dominant plant of the sand-slope, and a compact mossy saxifrage of high sheltered gullies, *Saxifraga globulifera* var. *gibraltaria*. All are now in cultivation at Gibraltar's Alameda Botanic Gardens and have been reintroduced to the wild to restore or reinforce diminished native populations. New plants keep turning up on the Rock, from inconspicuous weeds like Fiddle Dock (*Rumex pulcher*) to showy bulbs such as autumn-flowering *Muscari parviflora*. Resident birds too are returning, with ravens and eagle owls breeding again in recent years. And each spring and

autumn huge flocks of migrants pass the Rock as they navigate the Straits of Gibraltar.

In July 2006, the EU recognised the Upper Rock and sand-slope as an area of Special Community Interest, along with coastal waters rich in dolphins and other marine life off the southern part of the Rock. The same year auspiciously marked the 190<sup>th</sup> anniversary of the Alameda, under the inspired directorship of Dr John Cortes both nerve centre of a comprehensive integrated conservation strategy for the Rock's flora and headquarters for the Gibraltar Ornithological and Natural History Society (GONHS), which has published a Biodiversity Action Plan (2006) for



Gibraltar candytuft, *Iberis gibraltaria*



Barbary macaques, *Macaca sylvanus*



Apple of Sodom, *Solanum sodomium*



East Side from Med Steps showing regenerated habitat

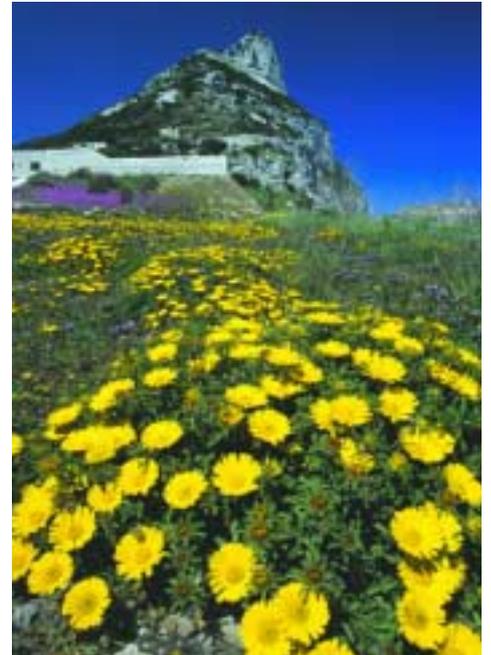
Gibraltar. A major initiative co-ordinated by Dr Eric Shaw (whose main research is the macaques) has restored the sand-slope, covered for decades by a corrugated iron water catchment, adding 80 ha of habitat to the Rock – and the best displays of wildflowers in almost a century. Sown with local seed in the spring of 1997, within a year the slope held some 60 species and now more than 80 are present, including healthy populations of grasses. A 2005 fire caused little damage, although serving to eliminate invading alien Acacia, and insects, reptiles and birds, not least Barbary Partridge, are returning to the restored habitat.

Gibraltar is thus not only a classic example of a Mediterranean coastal town with rich habitats on its doorstep, but also demonstrates what can be done to conserve species and habitats in close proximity to human habitation. For more information, visit the GONHS website ([www.gonhs.org](http://www.gonhs.org)).

*Dr John Akeroyd has been working on botanical surveys at Sherkin Marine Station since 1990. Leslie Linares, who took the photographs, is a retired science teacher and co-author of The Flowers of Gibraltar (1996).*



Photos: © Leslie Linares



- Clockwise from top:  
 Dr John Akeroyd on Douglas Path, Gibraltar;  
 Gibraltar chickweed, *Cerastium gibraltarium*;  
 Gibraltar campion, *Silene tomentosa*  
*Asteriscus maritimus* on Windmill Hill Flats;  
 Dutchman's pipe, *Aristolochia baetica*.



# Geological Survey of Ireland

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# The Forest School



Work in progress in the woodland. The F on the tree stump marks where the fireplace will be, and the larger logs will be arranged to provide seating for the children.

By Sharon Jones

FOREST SCHOOLS started in Sweden in the 1960's for disadvantaged children. They have demonstrated success with children of all ages who visit the same local woodlands on a regular basis and through play, learn about the natural environment, how to handle risks and most importantly to use their own initiative to solve problems and co-operate with others. Programmes run throughout the year,

with children going to the woods in all weathers (except for high winds). Children use full sized tools, play, learn boundaries of behaviour (both physical and social), and grow in motivation. They are given the time to thoroughly explore their thoughts, feelings and relationships. This develops understanding of the world, the environment and everything within it through use of their emotions, imagination and senses.

Forest Schools involve the children (age range 3 – 18) working with qualified Forest School Leaders and their nursery leaders/teachers. They follow their usual curriculum, but in an outdoor context, using learning and teaching strategies which raise self-esteem, develop confidence, independence and language and communication skills.

During the last five years or so several innovative projects have become established in the

UK, notably in Somerset, Oxfordshire, Worcestershire, Shropshire, Devon and Kirklees. Wales has an umbrella group (Forest School Wales), supported by the Welsh Assembly.

## Developments in Shropshire

A steering group was formed in 2002 with representatives from the Local Authority (LA) Early Years and Childcare team, local woodland owners and environmental educators. Since then, this group has become registered as a Forest Education Initiative Cluster Group, this organisation having been instrumental in developing a Forest School network across England.

The Shropshire Early Years Development Childcare Partnership (EYDCP) provided funding for 16 places on the OCN Level 3 Forest School Practitioners training course. Training took place in 2003 and, as part of this, five temporary pilot Forest School sites were established by the trainees in south Shropshire. The EYDCP then offered funding to develop a permanent Forest School site near Shrewsbury to be accessed by local nurseries and playgroups from summer 2004. It is the aim of the EYDCP to identify additional sites and groups to work with, to raise funds and to offer training opportunities more widely.

Forest School opportunities in Shropshire are also being developed, and sessions run by the Forestry Commission at Wyre Forest and by Shropshire Wildlife Trust, via the Blue Remembered Hills Project. Shropshire County Council now employs a part time Forest School Co-ordinator and two Forest School Leaders. There are four Forest School sessions running each week at their exemplar site near Conover, south of Shrewsbury. There are now over fifty trained Forest School Practitioners in Shropshire, most of which have set up a Forest School site within or near their setting. In addition to this, schools in the county have been accessing the exemplar site.

## St. John the Baptist Primary School

One of the schools involved is St John the Baptist Primary School in the village of Ruyton-XI-Towns, Shropshire. After a very successful term of Forest School at an exemplar woodland we decided to develop our own sessions, starting with the school grounds. The project here is well under way, and so far has included training in Forest School leadership and enhancing the school grounds with a Forest Schools Area. This now has a shelter, fire area, and log seating, also a magnificent carved storytelling chair. The site has been further enhanced by a woven willow tree. The project has received a great boost because a nearby woodland has kindly been made available by a local farmer, Mr John Gittins. This is currently being prepared and has involved some thinning of trees to create a relatively open area for children's activities. As in the school grounds, there will be a shelter, fire area, and log seating.

All of this preparation has involved teachers, parents, school governors and other volunteers from the village, and local craftsmen and women. Most importantly, it has involved the children themselves, in all kinds of activities, such as planning, clearing brash from the woodland floor, helping to build a shelter, and weaving willow leaves.

## How Does It Work Educationally?

A Forest School provides ways for meeting Foundation Stage/National Curriculum learning objectives whilst developing practical life skills and encouraging child initiated learning, which is observed and assessed. Many children benefit from and prefer a practical element to their learning, and achieve greater levels of success in this context than in a traditional classroom environment. All children benefit from opportunities to demonstrate a wider range of knowledge and expertise – especially important for those who don't often



In the school grounds, Helen and Kelvan are taking a break from making a woven willow enclosure. This surrounds the story-telling chair sculpted by Chris out of a crown of oak. There's room on the chair for Helen and Kelvan, or alternatively for five children.



Children making leaves for a woven willow tree which is going near the story-telling chair.

'shine' in the classroom. Their peers accord them and their achievements greater respect.

A Forest School is particularly successful in developing self-esteem and confidence, and motivating children who, for a range of reasons, struggle in a classroom environment. There are additional physical, social and health benefits for children and young people who are leading increasingly indoor lives, helping them to enjoy physical activity outdoors and mitigate obesity.

Children and young people become more confident in their own natural and made environments, and acquire a deeper understanding about environmental issues locally and globally. Parents, particularly fathers, are more likely to involve themselves in projects of this sort, and become engaged in their children's education. Improved behaviour and motivation go back into the usual learning environment with the children, and have an impact on achievement.

## The Vital Importance of Play

"Play is a generic term for a variety of activities which are satisfying to the child, creative for the child and freely chosen by the child" (The charter for

children's play)

There have been many studies about children's play. It is now accepted that children learn through play and that play is essential to our overall development.

Play is natural and helps children to:

- Prepare for life
- Find out about their environment
- Develop confidence and self esteem
- Sort out choices
- Express themselves
- Develop the imagination
- Be creative
- Be energetic and boisterous
- Use social skills, like sharing and communication
- Have opportunities to learn about other cultures
- Take risks
- Resolve conflicts
- Negotiate
- Experiment
- Solve problems
- Reflect and contemplate
- Test out their knowledge and understanding

Sharon Jones, Forest School Leader, St John the Baptist Primary School, Ruyton-XI-Towns, Shropshire, UK.

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# In House Enforcement of Environmental Regulations

## An Industrial Viewpoint

Sherkin Island Marine Station's Annual Environmental Conference in March this year was titled "Enforcement of Environmental Regulations". In all, 12 papers were presented. One of these was "In House Enforcement of Environmental Regulations - An Industrial Viewpoint", presented by Bryan Mohally, Managing Director of Janssen Pharmaceutical Ltd, which is part of the Johnson & Johnson Group of Companies. Here we summarise the main parts of his paper:

### Johnson & Johnson

Janssen Pharmaceutical Ltd. manufactures active pharmaceutical ingredients for worldwide export from Little Island, Cork, where the company employ 300 persons on a 25 year old site. Janssen Pharmaceutical Ltd is a member of the Johnson & Johnson (J&J) family of companies (www.jnj.com). J&J employ over 110,000 employees in over 200 operating companies across the globe, selling products in over 175 countries.

### The Company's Credo

Janssen Pharmaceutical Ltd. use the J&J Credo as their fundamental principle of operation. Originally written in 1943, but regularly reviewed and revised as necessary. The paragraph relating to responsibilities towards the community is as follows:

*'We are responsible to the communities in which we live and work and to the world community as well.*

*We must encourage civic improvements and better health and education.*

*We must maintain in good order the property we are privileged to use, protecting the environment and natural resources'.*

This Credo document guides each member of the J&J family of companies to identify its stakeholders: shareholders, employees, neighbours, customers, suppliers, etc; to identify their needs; and to satisfy those needs. This single page is further elaborated into J&J global policies, (e.g. J&J Environmental policy), procedures, (e.g. Business Conduct) and systems. In turn, Janssen Pharmaceutical Ltd. have incorporated these into their local certified management systems and policies.

The number one priority is to ensure that the organisation earns the right to exist with respect to its requirements relating to Health, Safety and Environmental Protection. It operates under an Integrated Pollution Prevention and Control (IPPC) licence (first issued in 1995) issued by the Environmental Protection Agency. This permit regulates all aspects of its site operations including emissions control, waste management and resource reduction (e.g. energy and water). Janssen Pharmaceutical Ltd. achieve consistent compliance with emission limit values and have maintained a record of zero community complaints in the last 5 years.

### Environmental Management

Within the Environmental section in Janssen six people are directly involved in the day to day operation of the Environmental systems (e.g. the onsite wastewater treatment plant, the air abatement plant, waste handling, management system maintenance etc).

Organisational Systems, structures and

accountabilities were realigned to provide a new framework focusing on "customer" requirements. By identifying the critical business processes this framework challenges the organisation to do only those things that provide "value" from the customer's point of view moving from piece-meal problem-solving to system-wide improvement. This change has resulted in excess of 90 people being directly involved in Environmental Management activities across the site as part of the overall site Health, Safety and Environmental (HSE) Process.

The HSE process is a customer driven process focused on engaging as many people as possible in order to drive continuous improvement. Committees and teams operate across the site in support of the process covering the various elements such as Energy Management, Risk Assessment & Emergency Response.

### HSE Operations Committee

The Health Safety & Environment committee meets on a weekly basis and manages the HSE process to achieve company targets and promotes good Health, Safety and Environmental best practices. Committee members include: the Safety Manager, the Environmental Supervisor, the Plant 1 Production Manager (Chairperson), Site Operations Leaders (x3), the Site Safety Representative, Industrial Hygienist and a Process Development Chemist.

### HSE Work Area Teams

Work areas teams consisting of the Area Manager and area representatives are in place across the site (e.g. Production Plant areas (x3), Environment, QC, Admin, Warehouse and Engineering). Each work area team is responsible for developing their own work area HSE Management Action Plan and reviewing their own HSE performance via the use of a scorecard.

### Developing a Strategic Focus

An important element of any Environmental Management system is looking ahead, monitoring emerging issues and ensuring that robust processes exist to enable the early identification of future challenges in order to ensure changes to its systems to address the needs in a timely manner in order to ensure continued compliance. Various mechanisms are used by the site HSE process to stay abreast of these changes.

Quarterly reviews are conducted on all pending Environmental legislation (Irish and EU) with action plans being developed where the need to change is identified; be it a need to amend a site practice, policy or procedure. Membership of the PharmaChemical Ireland Responsible Care Environmental Working Group and Comhar, the National Sustainable Development Council provide other means for the early identification of proposed legislative changes as well as providing a mechanism for commenting on draft legislation.

### Checking Environmental Performance

As a requirement of its EPA IPPC licence the company must adhere to strict monitoring and measurement conditions relating to its operations. Results of all monitoring activities are submitted to the EPA on an annual basis. The EPA also conduct monitoring on a frequent basis of both emissions to air and emissions to water. Audits of the facility are also routinely conducted by Agency personnel.

An extensive internal audit programme operates each year. Personnel from across the site have been trained as Internal auditors and each year they conduct assessments of all operations against both the ISO 14001: 2004 Environmental Management Standard and Corporate Sustainability practices.

Environmental Objectives are integrated into the overall objectives of the site HSE process. Monthly and quarterly performance assessments are conducted by the HSE Committees.

### Business Benefits

The company strongly believes that the development and maintenance of a robust and fully integrated environmental management system enables an organisation to ensure compliance with all Environmental requirements while at the same time yield clear business benefits.

- Integration has allowed all employees to understand that Environmental management is not just the responsibility of the environmental function but that all employees, contractors and visitors have a role to play.
- Costs associated with resource usage (e.g. Solvent) have been reduced in line with the % reduction in usage volumes at a minimum. The focus on campaign lengths and Process Excellence projects on Water and the Solvent usage associated with cleaning have led to significant cost avoidances.

### An Environmental Partnership

Environmental Compliance can only be achieved via the engagement of all stakeholders (Employees, Suppliers, Community, Customers). Janssen use a partnership approach between all key stakeholders to increase the level of awareness of the wider community on the importance of environmental protection. The following are some examples on how this is applied:

### Employees

- Employees are an integral part of the site HSE process and are invited to use the on-site Suggestion schemes and the hazard reporting system in order to help identify opportunities for improvement.
- All employees and contractors receive Environmental Induction training on the commencement of employment. All contractors must watch a video and complete a questionnaire prior to gaining access to the site.
- Employees are also trained as Environmental auditors, members of the site Emergency

Response teams and as 'Train the trainers'.

- An annual HSE Week is run in order to complete mandatory HSE training for all employees.

### Community

Janssen were founder members of the Little Island Community & Industry Liaison Committee (formerly known as the Little Island Environmental Liaison Committee.) This group focuses on issues within the local area allowing for two way dialogue between the residents and the companies. Based on the significant success of having this partnership in place the local residents proposed that the groups' focus would be expanded to take broader community based issues into account, moving away from environmental issues alone. Topics currently being discussed include Careers Exhibitions and Traffic Management. Janssen via the Environmental Manager currently hold the position of Secretary for this committee which meets on a quarterly basis. Janssen also operate a process whereby the residents are consulted prior to all planning applications in order to provide a means for taking their views into account.

Janssen have worked with the local schools over the years in order to increase the level of environmental awareness amongst the student population. Janssen recently worked with the Glanmire Community College in the achievement of their Green Flag status.

Since 2002, the Janssen Environmental Manager has been an active member of the Cork Chamber of Commerce Waste Management Taskforce. In this role she has presented on the Janssen Environmental Management practices to Chamber members and was also integral in the development of the Chamber Green Failte Award www.greenfailte.ie scheme for the Hospitality sector now in its second year.

In 2000 Janssen outlined a proposal to Cork County Council for the provision of a Household Hazardous Waste Collection within the local community. The local authority welcomed this and initiated a program. Cork City and County Councils now continue to operate this scheme on an annual basis with the continued support of Janssen and additional companies.

In order to facilitate the local residents in the event of an odour query in the Little Island vicinity the company has agreed to be the primary point of contact for the residents, the procedure stating that it would then initiate contact with all other Pharmaceutical Ireland Companies. This eliminates the need for the residents to have to contact each site individually.

### Customers

In preparation for the development of an Environmental and Social Responsibility report for 2002 Janssen sought the opinion of its stakeholders in determining the preferred content of the proposed report. A questionnaire was sent to representatives from each of the stakeholder groups: Local residents, employees, contractors, suppliers, local authorities (County Council/ EPA), community groups. Their comments were included in the report and the requirements have also been carried forward into the subsequent Values into Value reports now being produced on an annual basis.

**Mr. Mohally, in his final statement said:** "To conclude, we firmly believe that the engagement and partnership of all stakeholders and the integration of environmental management practices into all aspects of the business operations is the key to our success in the achievement of continued environmental compliance."

*Bryan Mohally, Managing Director, Janssen Pharmaceutical Ltd., Little Island, Co Cork, Ireland. www.jnj.com*



# Carangidae

## in Irish & Northern European Waters

By Declan T. Quigley

SCADS, horse-mackerels, jacks, crevalles, amberjacks, pompanos, threadfins, bumpers, trevallys, runners, leerfish, vadigo, derbio, permits, lookdowns and pilotfish belong to a large and diverse family (*Carangidae*) of mainly tropical and warm temperate marine fishes represented by 32 genera and 140 known species. However, only 25 species (representing 14 genera) have been recorded from the North-eastern Atlantic and the Mediterranean; 14 of these species (representing 9 genera) from European Atlantic waters and only 3-4 species (representing 3 genera) from Irish waters (Table 1). The family includes many valuable food and sporting fishes.

The scad or horse mackerel (*Trachurus trachurus*) is the only common member of the *Carangid* family in Northern European seas where it is heavily exploited as a valuable food fish. Between 1982 and 2005, landings of the Western European stock averaged 247,500 tonnes per annum, peaking during the mid-1990s at 400-500,000 tonnes before declining to a mean of around 150,000 tonnes in recent years.

While the other *Carangid* species only occur as rare vagrants from warmer waters to the south, there has been a notable increase in the number of species occurring in UK, French and Mediterranean waters over the last half century and recent

climatic changes, particularly thermal increases, have been suggested as a causative factor. For example, in French waters, the number of species increased by 100% from 5 in 1950 to 10 in 1987, while the number of species recorded in UK waters increased by 166% from 3 in 1951 to 8 in 2000. Over the same period, the number of species recorded in Irish waters increased by 100% (following the unconfirmed capture of a greater amberjack *Seriola dumerili* in 1990 off Kilkee and the first authenticated almaco amberjack *S. rivoliana* off Connemara in 2006).

### Pilotfish (*Naukrates ductor*)

The pilotfish is primarily a pelagic oceanic species found worldwide in warm seas. Although it has been recorded on one occasion from Norwegian waters, it is generally regarded as an uncommon or rare wanderer in northern European waters (N of the English Channel). Nevertheless, the species has been recorded with increasing frequency in Irish waters since the late 1950s; about 90 specimens have been recorded to date. The species' well known habit of accompanying floating objects such as seaweed, boats, rafts and driftwood and apparent semi-obligate commensal relationship with sharks, rays, turtles and jellyfish, may account for its widespread distribution. Indeed, a significant number of the specimens recorded in Irish, UK and French

waters were found in association with Leatherback turtles (*Dermodochelys coriacea*). In tropical waters, they are often found in association with blue shark (*Prionace glauca*), but this has not been observed in Irish waters. Although pilotfish are rarely taken by anglers, a specimen weighing 298g was captured on rod & line in the Towry Estuary, Carmarthen Bay, Wales during 1997.

### Almaco Amberjack (*Seriola rivoliana*)

The almaco amberjack has a worldwide circum-tropical distribution, only entering temperate waters in some areas. Adults are pelagic and epibenthic (on outer reef slopes and offshore banks) and possibly more oceanic than other *Seriolids*; juveniles are pelagic and usually occur offshore, often under floating seaweed and debris, but occasionally close to the shore. The World Record rod & line caught (Atlantic) almaco amberjack weighing 35.38kg was captured off Argus Bank, Bermuda in 1990 while the Pacific record weighing 59.87kg was taken off La Paz, Baja California, Mexico in 1964.

Although the species is apparently rare in the NE Atlantic and Mediterranean, juveniles have been recorded with increasing frequency in Northern European waters since the mid-1980s. For example, since 1984, a total of 6 specimens have been recorded from UK waters and since 1987, a total of 10 specimens from French waters. The species was recorded for the first time in the Mediterranean in 2000 and from Irish waters in 2006.

It is interesting to note that over the same period other *Carangids* were recorded for the first time in Mediterranean [lesser amberjack *S. fasciata* (1993) and Guinean amberjack *S. carpenteri* (2000)], French [*S. carpenteri* (1985) and *S. dumerili* (1984)], UK [*S. carpenteri* (2000) and blue runner *Caranx crysos* (1992)] and Irish [*S. dumerili*? (1990)] waters.

### Conclusions

Although the total number of *Carangids* recorded from Irish waters is relatively small compared with those in French and UK waters this may only be a reflection of poorer recording effort. Indeed, it would not be surprising if the following species were already visiting Irish waters, albeit infrequently, and both anglers and inshore commercial fishermen are most likely to encounter them: vadigo (*Campogramma glaycos*), *C. crysos*, *S. carpenteri*, *S. dumerili* and *derbio* (*Trachinotus ovatus*). Commercial landings of scad (*T. trachurus*), particularly from southern Irish waters, would also warrant more diligent investigation because the closely related Mediterranean horse-mackerel (*T. mediterraneus*) is known to be relatively common nearby in the Bay of Biscay.

Top: Atlantic Horse Mackerel (*Trachurus trachurus*)  
Middle: Pilotfish (*Naukrates ductor*)  
Bottom: Almaco Amberjack (*Seriola rivoliana*)

Table 1. Carangidae of the NE Atlantic & Mediterranean

Common Name	Species Name	Iceland	Scandinavia	Ireland	UK	France	Atlantic Spain	Portugal	Atlantic Morocco	Madeira	Azores	Mediterranean
Alexandria Pompano	<i>Alecis alexandrina</i>						(5)					(5)
String Scad	<i>Alopias dedekii</i>											(2)
Vadigo	<i>Campogramma glaycos</i>				(2)							(10)
Blue Runner	<i>Caranx crysos</i>				(11)	(8)						(3)
Crevalle Jack	<i>C. lineatus</i>						(5)					(10)
Horse-eye Jack	<i>C. melano</i>											
Black Jack	<i>C. ignobilis</i>											
False Jack	<i>C. thomasi</i>						(5)					(5)
Mackerel Scad	<i>Decapterus maculatus</i>											(1)
Round Scad	<i>D. roundi</i>											(1)
Rainbow Runner	<i>Elizavetha labridoides</i>											(3)
Leerfish	<i>Lutjanus kottii</i>					(2)						
Pilotfish	<i>Naukrates ductor</i>			(10)		(120)						
Coelby Jack	<i>Pseudocaranx dentex</i>						(100)					
Orange Scad	<i>Seriola lalandi</i>											
African Lookdown	<i>Seriola lalandi</i>											
Guinean Amberjack	<i>Seriola lalandi</i>					(5)	(8)					(10)
Greater Amberjack	<i>S. dumerili</i>			(17)	(8)	(3)						
Lesser Amberjack	<i>S. fasciata</i>										(1)	(10)
Almaco Amberjack	<i>S. rivoliana</i>			(7)	(8)	(10)						(1)
Derbio	<i>Trachinotus ovatus</i>			(Denmark, 2)	(3)	(17)						
Mediterranean horse-mackerel	<i>Trachurus mediterraneus</i>											
Blue Jack Mackerel	<i>T. picturatus</i>					(5)						(10)
Atlantic horse-mackerel	<i>T. trachurus</i>											
Common horse-mackerel	<i>T. trachurus</i>											

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# BRYOZOANS

## Notable inhabitants of Irish coastal waters

By Patrick N. Wyse Jackson

WALK along any shoreline in Ireland and you will find bryozoans. Although they are not widely known to most people they are in fact quite common and easily found. Pick up any piece of bladder wrack seaweed and almost certainly it will have small patches resembling a mesh-work or net curtains encrusting the surface. These are bryozoans, and are best seen in the field using a X10 hand lens.

### What are bryozoans?

Members of the Phylum Bryozoa are marine or freshwater colonial invertebrates. Marine bryozoans usually inhabit shallow environments in polar, temperate and tropical oceans. Bryozoa first appeared during the Ordovician period some 450 million years ago. Today 5,000 living species are known.

### Bryozoan colonies

Like some sponges and corals, bryozoans form colonies of various shapes and sizes that are typically less than 10 cm in diameter (the largest colonies reach over 1 metre in diameter). Most are cemented to a substrate such as shells, sand grain or seaweed. Encrusting colonies may form a runner-like morphology, or may be composed of single or multi-layered sheets of zooids. These forms are frequently found on seaweeds or on shells (Figure 1). Many bryozoan colonies grow upwards into the seawater, which allows them to feed from cleaner and faster flowing water above the sea floor. Branches may be cylindrical or flattened (Figure 2). Some bryozoans form a meshwork pattern of branches joined by crossbars (Figure 3).

### The bryozoan animal

The individual bryozoan animal measures 1 mm or less in diameter

and is called a zooid. Many thousands live in a colony and each zooid lives in a box-like or cylindrical chamber, which may open to the surface via an aperture (Figure 1). The feeding autozooids comprise a polypide and additional tissue, which secretes the skeleton that forms the colony. The polypide has a tentacle-structure called a lophophore, which is used to catch food. To feed it opens out through the aperture and can create inhalant water currents which carry food to the mouth, and exhalant currents, which carry waste away. Other zooids have other functions such as defending the colony from predators. Bryozoans reproduce sexually to produce larvae, which may be brooded in modified zooids called ovicells. When released into the water the larvae settle on a suitable substrate and the colony then grows by asexual budding.

### Bryozoans in Irish waters

In 1991 I compiled a list of all the bryozoans found in Irish marine waters (P. N. Wyse Jackson, 1991, Bulletin of the Irish Biogeographical Society). In total 192 species had been reported by then, and since then a few additional species have been added to that number. Good identification guides by Peter Hayward and John Ryland are available from the Field Studies Council ([www.field-studies-council.org/publications/synopses](http://www.field-studies-council.org/publications/synopses)).

### Problems caused by bryozoans

Along with barnacles, bryozoans are major foulers (encrusters) of harbours, oil rigs, and the hulls of ships. A heavily encrusted ship will take more fuel to power it through the water due to the increased drag caused by encrustations, and so anti-fouling paints are used to deter settlement of larvae and thus growth of bryozoan colonies. Bryozoans frequently encrust polystyrene and plastic bottles.

### Medically helpful bryozoans

Some bryozoans contain substances that inhibit cell growth. Bryostatins are one such substance and research is continuing to demonstrate their effectiveness in the fight against cancer.

### Early Irish contributions to bryozoology

Bryozoology is the term used to refer to the study of bryozoans. While research continues to be carried out on both living and fossil bryozoans from Ireland, a number of researchers from or working in Ireland made fundamental findings when the study of these organisms was in its infancy (P.N. Wyse Jackson & M.E. Spencer Jones, *Annals of Bryozoology*, Dublin, 2002). John Ellis (1710–1776), who apparently was born in Ireland, was a London-based businessman who had trade connections with the American colonies. In 1755 he published one of the earliest treatises in English on corallines in which he described and illustrated taxa now known to be bryozoans. John Vaughan Thompson (1779–1847) who was an Army surgeon working in Cork erected the phylum Polyzoa in 1830 into which these animals were placed. However the previous year the term 'Bryozoa' had been coined for these colonial animals, and rightly so Thompson's terminology became obsolete. George James Allman (1812–1898), a Cork-born biologist defined and described two of the presently recognised three Classes of bryozoans in 1856, and also produced an important monograph of freshwater bryozoans.

Bryozoans are wonderfully complex invertebrates that reward anyone interested in their study.

Patrick N. Wyse Jackson,  
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Figure 1: *Cryptosula pallasiana* and serplid worms encrusting an oyster shell; Sandymount, Co. Dublin.



Figure 2: Frond of *Flustra foliacea*. (Inset) Close-up view of *Flustra foliacea* showing flask-shaped autozoocidal chamber with small spines; east coast, Ireland.

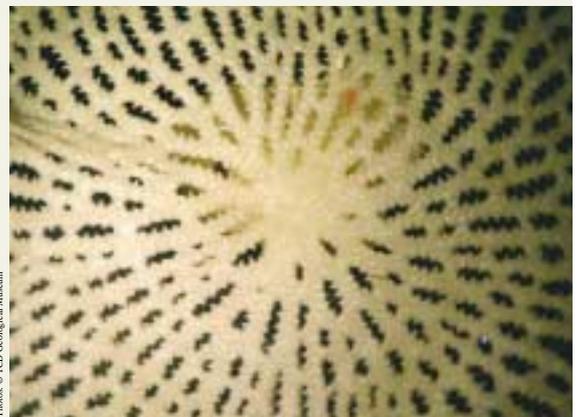


Figure 3: Fan-shaped colony of *Hornera* from New Zealand.

## Environment Ireland Conference 2007

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The Environment Ireland conference is a must-attend event for anyone requiring an understanding of the key environmental issues facing Ireland today. This two-day conference will be addressed by a panel of experts including the Minister for the Environment, Heritage and Local Government and will cover:

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# Steering a New Course

## Strategy for a Restructured, Sustainable and Profitable Irish Seafood Industry 2007-2013

IN the following two pages, Matt Murphy summarises the main issues and recommendations in the strategy report "Steering a New Course: Strategy for a Restructured, Sustainable and Profitable Irish Seafood Industry 2007-2013". The review was undertaken between July and November 2006 by Dr. Noel Cawley, Mr. Joey Murrin and Mr. Ruan O'Bric at the request of Mr. Noel Dempsey, TD, Minister for Communications, Marine and Natural Resources and Mr. John Browne, Minister of State at the Department.

The Irish seafood industry is critical for the sustainable development of remote island and coastal areas which in turn is dependent on sustainable fish stocks and a healthy marine environment. Generating total annual revenue of over €702 million and providing direct employment of some 11,615 people, the Irish seafood industry is a vital indigenous industry making a significant contribution to the economy in terms of output employment and export. The development of our marine resources is critical to the future prosperity of coastal areas where there are few alternative industries.

It is estimated that over half of all fish stocks internationally are fully exploited and a further quarter are either over-exploited. The total catch in the waters around Ireland in 2004 was 700,000 tons valued at €500 million, the greater proportion of which was taken by non-Irish vessels. (*Editor's note: values increase to at least €1 billion if the illegal catches of all countries fishing in our waters are included.*) The scientific assessment is that over 75% of these stocks are outside safe biological limits with either low stock size or unsustainable levels of exploration. Accordingly the Irish seafood industry is currently facing serious challenges to its survival and future development primarily related to declining stocks and quotas and consequent structural imbalances at catching and processing levels.

### The Market for Seafood

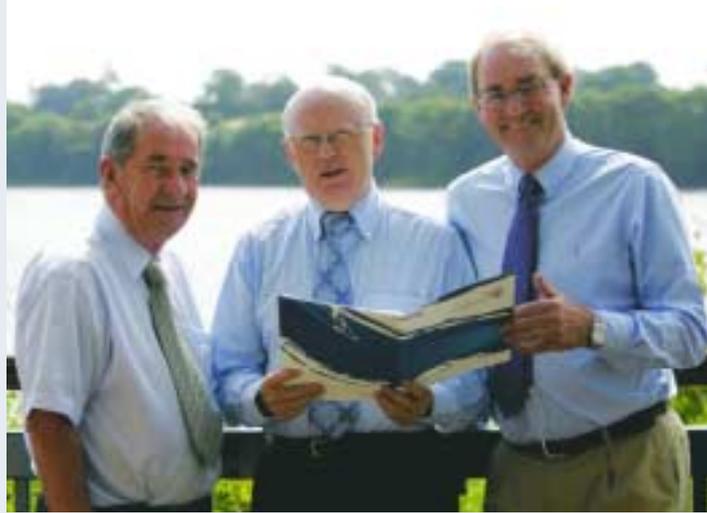
The EU imports an estimate of 74% of seafood products to satisfy an increasing demand for European markets. Unlike the agri-food sector, there are little or no direct EU price supports for seafood and trade. There is growth demand for most other protein products, with significant scope for future growth. There are significant untapped opportunities to develop new seafood products and particularly fish-based functional food products.

### Challenges that must be addressed

The Industry's performance within the market place is well below that which exists in other sections of the Irish food industry. Its investment in the area of innovation/new product development is weak with only a few minor exceptions.

The Irish seafood processing sector can be described as highly fragmented, operating at significant over-capacity unable to maximise

*demersal* "pelagic



Mr. Joe Murrin, Dr. Noel Cawley and Mr. Ruan O'Bric at the launch of the strategy report.

efficiencies and generating very little profit (loss making in many instances).

### Issues to be addressed

1. Need for a more innovative market-focused strategy throughout the industry - aimed at achieving the maximum possible return for each tonne of fish landed.
2. Lack of profitability, fragmentation and uncertainty of supply within the processing sector.
3. Imbalance between catching capacity and resource availability - requiring significant but managed industry restructuring and rightsizing.
4. Need for stakeholder-supported, commercially-aware fisheries management policies and procedures, based on strict compliance with quotas and other National and EU regulations.
5. Need for a comprehensive industry development programme supported by an appropriate regulatory framework, to encourage market-led investment to expand the aquaculture sector.
6. Obstacles preventing the sustainable exploitation of inshore fisheries.
7. Inadequate fish conservation and fishing practices, including mis-reporting, high-grading and discarding (often the consequence of EU regulations) need to be addressed to achieve fish stock/environmental sustainability.
8. Need for a level playing pitch throughout the EU with respect to regulatory compliance and conservation practices.
9. Need for improved relationship between the industry and the State and its policy-makers/regulators.

### AQUACULTURE DEVELOPMENT

Currently the Irish aquaculture sector contributes 38% by value of total primary production and in this respect is lagging behind the world-wide trend where close on half of all fish supplies now emanate from farmed sources. The following recommendations are made with a view to enhancing this sector's contributions to the income and welfare of coastal communities:

- A sustained fact based, communication programme run by State Development Agencies with industry support, should be undertaken to engender greater acceptance of aquaculture as a sustainable and legitimate activity by other stakeholders in the coastal zone. The ultimate objective of such an initiative would be to assist with the creation of an economic and regulatory climate conducive to increased flows of equity and capital investment.
- Review the current licensing and regulatory regime - with a view to strengthening current systems and procedures and delivering an improved service to customers.
- BIM in partnership with Udaras na Gaeltachta to implement an Aquaculture Industry Development Programme to include marketing and seafood processing. Also to have a broader focus dealing with key areas such as improving competitiveness, reducing environmental impact, encouraging farming of new species, applied R&D, quality assurance and environmental management systems with the aim of maximising the benefit of aquaculture to coastal and rural communities.
- There is a necessity to establish a Seed Capital Scheme, which would accelerate the evaluation of new species and adoption of new technologies.
- The review of mussel seed resources for the management of this critical resource.

10. Fragmented representation in a fragmented industry.

### Details of the Issues

The industry to capitalise on the enormous potential offered by the market. The Group propose that a budget of €55 million be allocated for marketing over the 2007-13 period - which is 7.8 million annually compared with 2.5 million in previous years. Outside of the core EU markets support in research and development should be delivered by BIM on a cost benefit basis to the sector. Over 70% of Irish seafood exports are sold with five EU markets.

A new seafood identity should be established and promoted to strengthen Ireland's market position and establish Irish seafood as a premium proposition with positive quality and environmental attributes.

BIM, Enterprise Ireland, Udaras na Gaeltachta and Teagasc should work more closely to align marketing and research. It is recommended that further examination is required to study the need for developing a seafood product research and development centre of excellence, mirroring the Dairy Products Research Centre in Moorepark, Cork. (*Editor's note: the obvious place to build this centre is Moorepark.*)

### Support for Investment

The recommendations:

- Support must be given to Irish Seafood processing businesses where there is good potential for the creation of sustainable long-term value.
- In light of strong demand and the positive future market potential for seafood a concerted effort should be made by BIM, Enterprise Ireland and Udaras na Gaeltachta to encourage and attract investment from the wider food processing industry.
- A benchmark study should be undertaken by BIM and Enterprise Ireland to establish clear targets for State supported investment in the processing sector and identify critical performance weaknesses impacting on competitiveness.

### Fleet Reconstruction Development

Support must be given to extending and developing the current Decommissioning Programme to bring about a better alignment between fleet capacity and resource availability through the permanent removal of 45% of the capacity of the demersal fleet 18 metres in length and over, which has been partly (10%) achieved through the present decommissioning scheme. The report recommends:

- Establishing a register of Commercial Sea Fishermen to be maintained by BIM. The provision of accurate and up-to-date information for the purpose of monitoring the Register should be a pre-requisite for eligibility for State support.
- Establishing a new and devolved fisheries management regime, together with an industry-based legal entity to oversee quota management.

## Fisheries Management

The recommendations:

- The Fish Producers Organisations should set up a legal entity to administer the devolved quota management regime for whitefish and pelagic fish.
- The Minister should establish clear fisheries management objectives that:
  - Maximise the long-term return from fisheries resources to Ireland.
  - Protect the marine environment.
  - Promote better and more transparent decision making
- Other issues to be included social, economic, safety and governance.
- Establishment of a new inshore fleet segment and designation special coastal areas with exclusive or priority access for inshore vessels.
- Sustainable fishing or other opportunities must be found for registered fishing vessels displaced from the salmon drift net fishery.



Members of the audience at one of the regional meetings.

## Enhancing Competitiveness

The recommendations:

- Establish efficient landing and distribution infrastructures to enhance the competitiveness and attractiveness of landing fish in Irish ports.
- Significant operational infrastructure and cost issues need to be addressed to bring them into line with best-in-class competing ports.
- BIM to work with seafood companies to identify effective distribution for both the domestic and international markets.
- A drive should be made towards developing a greater degree of direct access to retail, food service and ingredient customers and reduce the industry's dependence on intermediaries.
- Support for the pelagic sector's proposal to establish a first-point-of-sale auction system modelled on the Norwegian system. Such a system should be initially established by the relevant Producer's Organisations with EU/State support.
- The appointment of a Whitefish Marketing Co-ordinator by BIM to spearhead the consolidation of the current fragmented marketing structure at first point of sale.
- BIM must develop a systematic approach to working with fishermen, fish farmers and processors to identify sustainable performance and improvement cost-reduction initiatives technology transfer opportunities.
- The industry should be encouraged to engage in long term succession planning and provide incentives to attract and retain new entrants into the industry as applies in other sectors of the economy.
- The Group recognises that the extension of the Seafarers Tax Free Allowance already granted to Irish merchant seamen would be a very significant incentive for crew retention.
- Publish and adhere to a grant-aid decisions time-table.

## Marine Environment and Conservation

The long-term future of the seafood industry depends on a sensible and responsible approach to conservation and to the industry's environmental performance. This, however requires positive action from all EU member states not just Ireland. It is with this in mind that the following recommendations are made:

- Increase awareness and response to environmental policies.
- The State sector must put in place structures to properly inform the industry of conservation and environmental issues as they arise.
- The two way interaction of fisheries and aquaculture with the environment should be paramount in considering the future development of the industry.
- Local area management strategies should be promoted for sensitive stocks (particularly inshore species).
- Promote the introduction of Environmental Management Systems by the industry.
- Promote the development and uptake of environmentally friendly and fuel-efficient fishing gear.

The Irish fishing industry should take a lead role through the Regional Advisory Councils (introduced throughout the EU) to ensure that sensible conservation policies are developed and implemented across the EU that take account of the impact of fisheries on the environment.

The Irish Government and industry should actively promote and lobby the EU to adopt management strategies and fish practices to avoid large catches of juvenile fish with the ultimate objective of moving to a full-scale discard ban system.

A joint approach by the industry and the Department must be taken at EU level to ensure that EU regulations and control are strictly enforced through the Community.

## Education and Training

In supporting the significant industry development envisaged, increase investment in training will be required to address profitability, efficiency, environmental responsibility and sustainability across all sectors of the seafood industry.

BIM aquaculture training provision needs to be significantly expanded. They should focus more training resources in support of competence, safety, sustainability and profitability in the inshore and coastal sectors. In view of the significantly higher rate of accidents and machinery failure on inshore and coastal vessels unqualified skippers and mechanics on these vessels should be required to hold formal Department of Transport certificates of proficiency or competency as deemed appropriate.

## Industry Relations

The group recognises the very different issues/dynamics prevailing in the various industry sub-sectors. They believe there is a real need for the industry to speak with one clear and coherent voice. It recommends that all existing representative organisations should set up a new, single representative organisation. This would have its own Board and Chief Executive and be made up of distinct sectoral/regional interests to speak with a strong clear and coherent voice on behalf of the catching sector.

Given the onerous regulatory regime surrounding the seafood industry, serious commitment is required on the part of Government and senior officials to appropriately structure and resource its seafood administration, policy making and regulatory responsibilities. The adoption of a more respon-

## IMPACT OF STRATEGY AND INVESTMENT PROGRAMME

The implementation of the strategy recommendations and the proposed investment programme will result in a sizeable direct and indirect benefit to the seafood industry, the Irish economy and in particular to coastal/rural communities where this industry is mainly located. As a result of this investment, by 2013 the Irish seafood industry will have:

- Evolved to become a restructured, sustainable, self-reliant and commercially-aware industry with the market, as opposed to production/policy related concerns being the key industry focus.
- Secured a leading position across a range of target markets, both within Ireland and internationally, with Irish seafood clearly identified within the marketplace.
- Undergone substantial restructuring to the point where the catching capacity of the national fleet is aligned with the available resource and where a competitive, profitable processing sector has been established.
- Established a leading role in terms of environmental performance and be recognised as a key advocate and practitioner of fish stock conservation measures and regulatory compliance at national and EU level.
- Secured its position as a key contributor to balanced economic growth ensuring that the industry continues to be recognised as a vital indigenous natural resource based industry and an essential part of the fabric of coastal/rural communities.
- Contribute significantly to meeting the goals of a range of national and EU policies relating to fisheries, the marine environment, rural development and in particular the Government's National Spatial Strategy as it relates to remote coastal/rural areas.

sive customer-facing approach will pay dividends in terms of building bridges with the industry in due course.

The Group strongly recommends that a more co-ordinated approach should be adopted by the various state Agencies with research and development responsibilities for the seafood industry. The co-ordination of State development programmes and initiatives should be

spearheaded by the Department of Communications, Marine & Natural Resources.

A series of Operational Programmes should be prepared with the twin objective of giving effect to the recommendations set out in the Strategy Report and to accessing the maximum possible financial support from the new European Fisheries Fund, as well as the Exchequer in the forthcoming National Development Plan 2007-2013.

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# 2005 – An Bord Pleanála's busiest year ever

## Workload and Performance in 2005

The year 2005 was the busiest ever for An Bord Pleanála. The record intake of cases, which almost reached the 6,000 mark, was due to a number of factors – the continuing high demand for housing, the acceleration of infrastructure programmes, a large increase in employment and the phasing out of tax based incentives for certain kinds of development. Notwithstanding a 5% increase in cases determined, this resulted in a significant rise in the workload on hands at year end and a fall off in the Board's performance in relation to the timeliness of its decision making.

An overview of the Board's workload and performance in 2005 can be

**AN BORD PLEANÁLA is the appeals board to which people can appeal planning decisions of the Local Authorities. It has a very difficult task to fulfil – so often it is a no win situation. However it has over the years performed its duty admirably. We publish below the main points from the Annual Report 2005 made by the chairman of An Bord Pleanála, Mr. John O'Connor.**

gauged from the following facts:

- intake of new cases 5,946 – up 13% on 2004.
- cases determined 5,387 – up 5%.
- workload on hands at year end 2,062 – up 37%.
- 18 week statutory objective met in 78% of cases, compared to 85% in 2004.
- average time to determine cases – 15 weeks, compared to 14 weeks in 2004.

Other noteworthy features in 2005

- The percentage of local authority planning decisions appealed to the Board showed a slight

increase to 7.4% (from 6.9%\* in 2004).

- The rate of reversal of local planning authority decisions appealed showed a slight decrease - 30% in 2005 compared to 32% in 2004. The large disparity between local authorities in the rate of reversal, apparent in previous years, continued in 2005.
- Just under half of planning appeals lodged with the Board came from third parties, a slight decrease on 2004.
- Invalid appeals constituted 17.3% (19.6% in 2004) of all appeals determined, with late appeals (5.4%), invalid fee (4.7%) and third party appeals with no acknowledgement (4.4%) being the main reasons. The Board took additional measures in 2005 to help people avoid making invalid appeals.
- There were 139 applications for leave to appeal by third parties of which 21% succeeded. All appeals for leave to appeal were decided within the statutory 4 week period.

cases the Board has increased the panel of fee-per-case consultant planners from 53 to 76. I hope that these additional resources will enable the Board in the second half of 2006 to arrest the decline in our timeliness performance and move back towards achieving our strategic target.

## Infrastructure Projects

The Board constantly reviews its system of prioritising major infrastructure projects (whether planning appeals or local authority sponsored projects) to ensure that they are as effective as possible in shortening the timescale for decisions. In 2005 the Board received 78 and disposed of 77 planning appeals that were classed as major infrastructure developments, 61% being determined within 18 weeks. Of the 124 local authority sponsored projects (roads, waste, compulsory purchase, etc.) submitted to the Board in 2005, 74% were determined within 18 weeks.

The continued high level of demand for housing is reflected in the very strong trend in the number of appeals relating to large housing developments. Schemes of 30 or more housing units are accorded priority status in the Board - in 2005 the volume of these appeals increased by 21%.

## The Planning and Development (Strategic Infrastructure) Bill 2006

The Planning and Development (Strategic Infrastructure) Bill 2006, published in February 2006, will reform the consent process for a wide range of major infrastructure projects. It will have major significance for the Board both in terms of the scope of projects coming before it and the discharge of its mandate in relation to these projects. The Bill provides for the setting up of an Infrastructure Division in the Board to handle proposals from both public and private sectors relating to transportation, environmental and energy projects which are considered by the Board to be of national or regional strategic importance. The Board will become the consent authority of first instance for these strategic projects. The procedures to be put in place by the Board to give effect to the statutory provisions in the Bill will have to ensure that the requirement to process applications efficiently and expeditiously is balanced by the need to facilitate meaningful participation by local communities and interested

statutory and non-governmental organisations. Interested parties, from whatever angle they are coming, must feel that their views are taken into account in the final decision. In accordance with the mandate given to it by the legislation, the Board is determined that all projects coming before it will continue to be assessed rigorously, based on the principles of proper planning and sustainable development. The Board is acutely aware of the importance of maintaining public confidence in the way it determines these strategic projects.

## Public Confidence

The Board's three core principles of independence, impartiality and openness are embedded in our Mission Statement and objectives and underpinned by legislation. We are always mindful that public confidence depends on the integrity and quality of our decision-making and the professionalism with which we carry out our functions. There is a statutory code of conduct for all Board members, staff and consultants, which places stringent obligations on members and employees of the Board to declare interests and conduct themselves generally in a way that reinforces public confidence. It is the Board's policy to adopt the most open approach possible in its relations with the public and we operate a completely open file system once cases are determined.

## Accounts

Expenditure increased from the restated figure of €17,731,540 in 2004 (€14,944,540 stated in the 2004 report) to €18,799,861 in 2005 due mainly to increased remuneration and operating costs associated with the increase in intake of cases.

In 2005, fee income together with costs recouped from local authorities on infrastructure projects was €2,673,237 which represented 14% of the total costs of the Board's operations (12% in 2004). In 2005, income amounted to €18,600,906 (which includes €3,199,000 to reflect the net additional superannuation costs arising under Financial Reporting Standard (FRS) 17) leaving a deficit for the year of €198,955. There was an incoming deficit of €87,844 which left a cumulative deficit of €1,111. (The deficit figures are unaffected by FRS 17).

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Lo-call 1 890 275 175  
Email: bord@pleanala.ie  
www.pleanala.ie*

## To a Birch Tree

Where the road winds by the river  
And an old fort looks down  
On frothy waters  
I first saw your slender beauty  
In Laharn many years ago.

And ever since when I pass that way  
I look to see if you are there,  
Smiling in the summer sunshine  
Or gleaming white and bright  
On a wet November day –  
Constant in an ever-changing world.

If ever man should cut you down  
Or tearing winter storm  
Cast you mid briar  
And piercing thorn  
A joy would leave my life  
Because you and I have grown old together  
And you have become  
A friend.

*Diarmuid Ó Críodáin  
November, 1979*

*Diarmuid Ó Críodáin was born in the townland of Leacht, near Rathcoole in North Cork, in 1925. He worked as a manager in Kilkorney Creamery and later as Area Manager with Ballyclough Co-op. He began his poetic writing as a student in St. Brendan's College in Killarney and continued to write until his death in November 1990. "Leacht" is the collections of his poems – his inspirations and thoughts. In the Foreword, Rev. Robert Forde PP says of Diarmuid "He never failed to be impressed by the beauty and mystery of nature and it was a constant source of inspiration to him in his poetry."*



*Photo: Programme - Liscannuff*

# Dry Stone Walls: Ireland's Heritage

By Terry Farnell

IT'S strange to think that one of the most endearing features of the Irish landscape is a man-made construction and that most of these features were built within the last 150 years. Yet an Ireland without its patchwork pattern of dry stone walls would seem a poorer place indeed. And the walls have a story to tell.

Ireland has never been short of stone. In the Ceide Fields of Co. Mayo, men set about piling stones into barriers around 5000 years ago and these dry stone walls form part of the oldest known field system in the world. Subsequently, stone was used in various constructions, but it was not until the social and agrarian upheavals of the 19th century that the landscape of dry stone walls began to evolve into that which we see today.

During the famine years of the 19th century, one of the tasks of the work programmes, established by the Board of Works to provide employment, was land clearance and the building of dry stone walls. Evidence of these labours is still to be seen today, with some walls climbing across mountainsides to no apparent purpose. At the same time, the decrease in population and the eviction of tenants allowed landowners to extend and enclose their estates, with many of the dry stone walls

built by workers on the programmes. To this day, some walls are still referred to as 'famine walls'.

Towards the end of the 20th century, the declining art of dry stone walling experienced a resurgence and today there is a growing band of master craftsmen skilled at building dry stone walls and teaching the techniques to others. Over the years, walls do get damaged or collapse and have often been repaired or rebuilt by a landowner with little or no technical expertise. Whether this piecemeal approach has added to, or detracted from, the character of the wall is a matter for debate, but to the landowner it is often a simple case of functionality.

The reason for building a dry stone wall is as much for land clearance as for the demarcation of boundaries and the containment of stock. The design of a wall is often related to the underlying geology, with the shape of the stones dictating the way in which they may be fitted together. Walls constructed from rounded granite boulders will not have much in common with the appearance of a wall built from fissured limestone, so the genesis of the stone can account for the different characteristics of dry stone walls. The function of the wall has also to be considered. In many walls, larger stones are laid over small stones, which would seem to be contrary to good practice, but the small stones prove a greater barrier to rab-



Top - A carefully built wall is both functional and surprisingly stable.  
Above - Though walls may collapse over time, they can be easily rebuilt using the fallen material.

bits than would the larger ones.

A properly built dry stone wall may be as stable as any wall built from bricks and mortar, but with added advantages. Many walls are on exposed sites, but the permeability of the dry stone technique is sufficient to reduce the force of the wind, without causing undue pressure on the windward side, or turbulence in the lee of the wall, whilst providing far more shelter for stock than a wire fence. Also, the unstable appearance of a dry stone wall is a deterrent to stock, so they are less likely to try jumping over it. Add to that, if a stone is dislodged, it's a simple matter to replace it.

Even a careless glance will reveal the diversity of life that has made a home of a dry stone wall; the intricate lacework of lichens and the soft cushion of mosses compete with seasonal plant life to give a dry stone wall a unique character. Less obvious are the creatures that

exploit the benefits offered by this ecological niche, which, despite its often exposed position, supplies a well-drained and sheltered haven for a diverse collection of species. The plants and the insects attract bird life, while the wall itself may provide shelter and act as an observation point for birds and other wild animals.

From simple land clearance, the story of dry stone walls has encompassed a diverse range of subjects, from social tragedy to aesthetic appreciation and from construction principles to wildlife habitat. Much of this accords with the last 150 years, but with the growing commitment to Ireland's heritage, the sympathetic conservation of dry stone walls should assure their future.

Terry Farnell, Terry Farnell Photography,  
Sherkin Island, Co. Cork.  
[www.sherkinphoto.com](http://www.sherkinphoto.com)

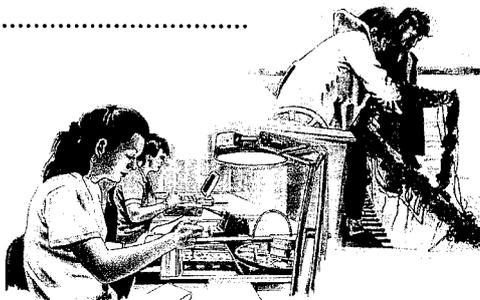


Some animals may use walls as access routes and vantage points.

## Forbairt na Gaeltachta...

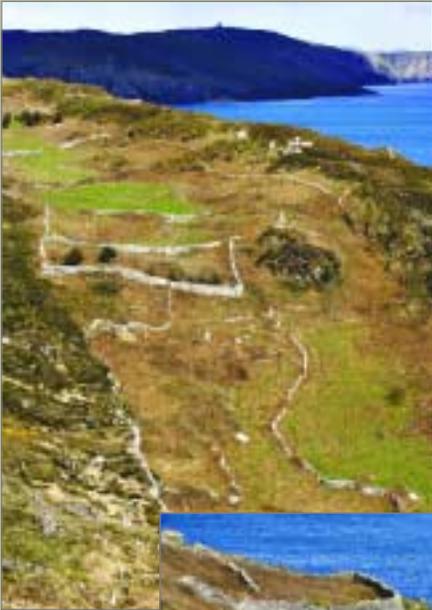
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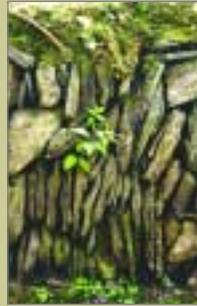


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Left: Land clearance and enclosure has resulted in a pattern of dry stone walls across the landscape.



Above left: The underlying geology can influence the building style of a wall. Above right: Infilling with small stones at the base presents a barrier to small animals.



Above: An old entrance to a field, blocked by stones that could be easily removed.



Above: Lichens are a characteristic feature of dry stone walls.



Right: A wall offers this Peacock butterfly warmth and shelter.

Below: Birds often use a raised portion of wall for observation and territorial displays.

Photography by Terry Farnell

Below: A style of wall building influenced by the available material.



Left: Over time, walls are colonised by lichens and plants.



Right: At 8 ft high, this dry stone wall is a significant feature of the landscape.

# DRY STONE WALLS *Ireland's Heritage*





# A Spotlight on World Environmental Matters

by Alex Kirby

## Alarming climate changes predicted

The first volume of the fourth assessment report by the Intergovernmental Panel on Climate Change (IPCC), published on 2 February, makes startling reading. By 2100, the IPCC says, global average temperatures could be between 1.8°C and 4°C higher than in 1999, although some of the scenarios it considered suggested a rise of as much as 6.4°C (the Earth today is only about 4.5°C warmer than during the last Ice Age). The IPCC says sea levels are expected to rise by between 18cm and 59cm over the same period. But it took no account of the extra water that will be added to the oceans from melting ice caps, so the real figures could be much higher. The scientists said the changes are "very likely" caused by human activity, which means they think the certainty that the warming results from the burning of fossil fuels is higher than 90%, and it is almost impossible to blame natural variability alone.

## Proposal to monitor countries who fail to act against climate change

More than 40 countries are supporting the idea of an international organisation to regulate governments which fail to act against climate change. It would also tackle threats like water shortages and the loss of species. President Jacques Chirac of France, proposing the creation of a United Nations Environment Organisation, said: "It is our responsibility. The future of humanity demands it. We are coming to realise that the entire planet is at risk, that the well-being, health, safety, and very survival of humankind hang in the balance." The United Nations Environment Programme has argued for years

that it needs more money and greater influence within the UN system.

## Illegally shot or trapped birds found on Malta

Migrating birds from 38 countries have been found by conservationists after being illegally shot or trapped on the island of Malta. A study by BirdLife Malta found the remains of 14 birds ringed in the UK among them, including cuckoo, goldfinch, spotted redshank, gannet, great skua and short-eared owl. About 16 ospreys ringed in Scandinavia were also found. Experts say the number of ringed birds from northern Europe found in the survey is probably only a tiny fraction of the number of migrating birds killed in Malta's spring shooting season. Malta's traditional indiscriminate killing of migrating birds nearly prevented its joining the European Union, but it managed to win last-minute concessions allowing some trapping until 2008. The island is believed to be the worst offender against the EU Birds Directive of all 27 member states.

## Wildlife Trust call for Marine Bill to protect coastline

The Wildlife Trusts, a federation of 47 county organisations which care for habitats and species across the UK, says a Marine Bill could help prevent MSC Napoli-type environmental disasters. The vessel, a container ship, was under tow to a south coast port in a January storm, but was grounded in Lyme Bay off south Devon, leaking oil and shedding some of its containers. The Bay, known as the Jurassic Coast, is a World Heritage site renowned for its internationally important wintering birds. It also has wildlife-rich reefs, with over 300 species recorded so far. Among

them are the seven species of coral, including the nationally protected pink seafan and the extremely rare sunset coral. The Trusts say a Marine Bill would introduce "a proper planning system for our seas", which would mean potentially damaging activities could be sited further away from environmentally and economically valuable areas.

## Changes in farming methods blamed for decline in UK bumble bee

Changing methods of farming appear largely to blame for the decline of the UK bumble bee, whose numbers have fallen by 60% since 1970. Researchers from several Irish universities say: "We suggest that the widespread replacement of hay with silage, which results in earlier and more frequent mowing and a reduction in late summer wildflowers, has played a major role in bumble bee declines." Formerly common in clover, hedgerows and around the edges of fields, most of the 20 or so species of bumblebee are in decline, and two have become extinct. Traditional hay meadows were not cut until after the plants that attract bees had flowered. But with silage, grass is cut more frequently and early in the season so the plants cannot flower. The researchers' study is reported in Biological Conservation.

## Climate change affecting Irish salmon stocks

Climate change appears to be affecting Irish salmon stocks, according to scientists on the river Bush in north Antrim. They say warmer winters are causing a disastrous false start to the salmon's annual migration. Believing spring has arrived, the juvenile fish are leaving the safety of the river too soon

and heading out to the open sea, where many die. Richard Kennedy, one of the scientists at the Bush Salmon Station, says: "Ten years ago the first smolt that would have left the river Bush would have done so towards the middle to the end of April, but that seems to be changing and now first departures can be as early as the beginning of March," he says. Gulls and seals pick off the smolts as they head out into the Atlantic. Usually about a third of the young fish which leave the Bush return the following year to spawn. But now only six per cent are making it back to breed. Another result of the changing climate is high rainfall, which swells the river in winter and early spring, washing the delicate salmon fry away.

## Switching to compact fluorescent bulbs

Australia is to ban incandescent light bulbs as a way of helping to cut greenhouse gas emissions. Malcolm Turnbull, the environment minister, said replacing the country's incandescent bulbs could by 2015 prevent up to 4m tonnes of greenhouse gas emissions entering the atmosphere every year. He said the ban would also cut household lighting costs by 66%. Cuba introduced a similar ban two years ago, and Venezuela has followed suit. Incandescent light bulbs are very inefficient, converting only about 5% of the energy they consume into light, with the rest turned to heat. The incandescent bulbs are to be phased out within three years and replaced by more efficient compact fluorescent bulbs. Although they cost more, they can pay for themselves within twelve months. "If the whole world switches to these bulbs today, we would reduce our consumption of electricity by an amount equal to five times Australia's annual consumption of electricity," Mr Turnbull said.



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# Urban Waste Water Discharges in Ireland

## A Report for the Years 2004 and 2005

THE Environmental Protection Agency (EPA) is required under Section 61(3) of the Environmental Protection Agency Act, 1992, to report on a biennial basis on the quality of effluents being discharged from treatment plants, sewers or drainage pipes which are vested in, controlled or used by local authorities. This report provides an analysis of the treatment of waste water for all agglomerations<sup>1</sup> (mainly cities, towns and villages) with a population equivalent over 500 during 2004 and 2005, the quality of discharges from waste water treatment plants and commentary on trends for the period 1998 to 2005. The report is based on information supplied by local authorities on an annual basis.

The end of the review period (31st December 2005) also coincided with a significant milestone in urban waste water treatment in Ireland, whereby secondary treatment was required for all agglomerations discharging to freshwaters and estuaries with population equivalents of 2,000 or greater and for agglomerations discharging to coastal waters with population equivalents of 10,000 or greater.

The report includes a county-by-county analysis of the performance of secondary waste water treatment plants covering their compliance against the Urban Waste Water Regulations, 2001.

The main findings of the report are:

- The overall level of treatment provided at 478 agglomerations, which collectively represent a total population equivalent (p.e.) of 5,627,456, was as follows:
  - 11% of waste water arisings received no treatment;
  - 5% of waste water arisings received preliminary treatment;
  - 2% of waste water arisings received primary treatment;
  - 70% of waste water arisings received secondary treatment; and,
  - 12% of waste water arisings received nutrient reduction in addition to secondary treatment.
- There have been delays in providing the required treatment plants at a number of locations throughout the country. Of the 158 agglomerations requiring secondary treatment or higher by 31st December 2005, the required level of treatment was not in place at 30 of these agglomerations.
- Large agglomerations which were required to have secondary treatment by 31st December 2000 but as yet has not been provided are: Bray, Howth/Baldoye /Portmarnock (Partial), Balbriggan, Killybegs, Shangannagh, Sligo Town, Tramore, and Waterford City.
- The largest untreated discharge to a sensitive area<sup>2</sup> is from Killybegs (Co. Donegal) with an estimated population equivalent of 400,000 p.e.
- Secondary waste water treatment plants are now operational in the cities of Cork, Limerick and Galway and these plants are meeting the effluent quality standards set out in the Regulations.
- Nutrient reduction, which is required for discharges to specified waters considered sensitive to the risk of eutrophication, has been provided for all agglomerations specified by the Regulations.
- Compliance with discharge limits for the very large plants (i.e. >15,000 p.e.) has improved; however the majority of smaller treatment plants are not complying with these limits. The compliance rates based on monitoring results are summarised in Table 1.
- Local authorities failed to take the required number of samples at 38% of waste water treatment plants with a population equivalent of 2,000 p.e. or over and where samples were taken, 43% of these were taken incorrectly (i.e. Flowproportional or time-based 24-hour samples were not taken).
- 121,750 tonnes of dried sludge was produced nationally by wastewater treatment plants in the period 2004-2005. 76% of this went to agriculture and 17% went to landfill.
- 75 waste water treatment plants were inspected by the EPA between 2004 and 2006. Recurring problems identified at waste water treatment plants visited during audits, which are in need of corrective action, include:
  - Inadequate collection systems for waste water (e.g. combined sewer overflows);
  - Inadequate screening of influent waste water and storm water overflows;
  - Insufficient treatment capacity;
  - Poor assimilative capacity for discharged effluent in some receiving waters; and,
  - Poor sludge management on site and incomplete sludge records.

In evaluating the causes of the non-compliance with the Regulations the EPA has concluded that many waste water treatment plants are under increasing pressure from development that has taken place throughout the country over the last number of years. The operation and management of some overloaded plants has proved difficult for some local authorities.

In order to achieve compliance with the requirements of the Regulations and secure improvements in the quality of effluents from urban waste water treatment plants the EPA makes the following recommendations:

- The provision of adequate treatment at the 30<sup>3</sup> agglomerations that did not have the required level of treatment by December 31st 2005 should be progressed as a matter of urgency. Local authorities need to proceed swiftly with planned schemes in order to ensure full compliance with the Regulations.
- Local authorities should ensure that all monitoring and analysis is carried out in accordance with the Regulations for all treatment plants including those that are managed and operated by third parties on behalf of the local authority.
- The frequency and volume of storm overflows within each collection system should be assessed, mapped and ranked in order of polluting potential.
- Where sludge is reused in Agriculture, Local authorities should ensure that the testing and management of the sludge is compliant with the requirements of the

Table 1: The compliance rates based on monitoring results.

Plant Category	Compliance (%)			
	1998-9	2000-1	2002-3	2004-5
< 2,000 p.e.	18	18	22	19
2,000-15,000 p.e	22	28	29	38
> 10,000 p.e with nutrient reduction	56	68	57	86
> 15,000 p.e	53	64	52	67

p.e. = population equivalent

Regulations and in particular that a nutrient management plan is used.

- Local authorities should prepare an odour management plan for each treatment plant operated by or on its behalf. The odour management plan should be a documented procedure available at the treatment plant at all times.
- Local authorities should determine whether all trade effluent discharges are appropriately licensed and should check the compliance of existing licences against their permitted discharge allowance. In particular local authorities should review the discharges from the growing number of food preparation outlets, which may be significant contributors of grease and fat loadings to sewer networks and municipal treatment plants.

### NOTES

<sup>1</sup> "agglomeration" means an area where the population and/or economic activities are sufficiently concentrated for urban waste water to be collected and conducted to an urban waste water treatment plant or to a final discharge point.

<sup>2</sup> "sensitive areas" Those areas specified in the third schedule of the Urban Waste Water Treatment Regulations, 2001 (S.I. 254 of 2001), Urban Waste Water Treatment (Amendment) Regulations, 2004 (S.I. 440 of 2004) and such other areas as may be identified pursuant to article 5 of the Urban Waste Water Treatment Directive.

<sup>3</sup> Secondary treatment has recently been provided for two of these agglomerations (Dungarvan and Carrick-on-Suir).

From the report "Urban Waste Water Discharges in Ireland - A Report for the Years 2004 and 2005". The full report is available for download on [www.epa.ie](http://www.epa.ie). Printed version €20.00 from the Environmental Protection Agency, PO Box 3000, Johnstown Castle Estate, Wexford.

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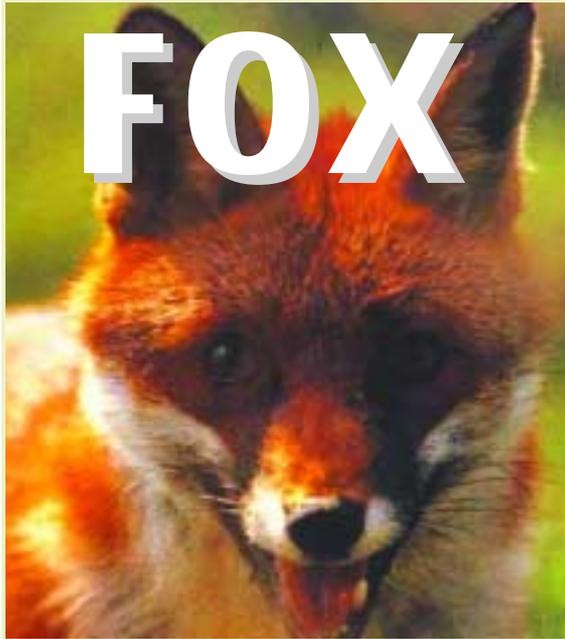
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son in January and February. A female fox, a vixen, is pregnant for 53 days and has a single litter per year. Cubs are born in March/April and the average litter is of 4-6 cubs. The tiny fox cubs only weigh 50-150 grams at birth and are not able to open their eyes till they are at least 9-14 days old. At 4-5 weeks of age they are finally able to leave the den but still need their mother to look after them until they are weaned at 8-10 weeks. During this time the vixen may choose to move her cubs several times to different dens for safety. The fox family stays together until the autumn, by which time the cubs are adult sized, at this time the young will disperse from the parents range to find their own territory. Young males will move up to 40km away and young females up to 10km. Once the young have established a new territory they will stay there for life. The fox cubs will be mature enough by the following mating season to start their own families. In captivity, foxes can live for up to 12 years, but in the wild, with dangers like traffic, hunting and fights between males, foxes typically only live for 3 or 4 years.

#### Feeding habits

Foxes are nocturnal creatures – that is, they are most active at night. If undisturbed, they may be seen during the day as well. Foxes are omnivores. This means that they eat other animals as well as plants. Among the fox's favourite foods are rabbits, birds and small rodents, such as rats. Sometimes the fox gets a bad name from farmers who blame them for killing lambs and poultry. Foxes in fact rarely prey on lamb and it makes up a very small part of their diet. Where lamb or sheep is taken it is most often scavenged from animals that has already died from other causes. Foxes do, however, prey on poultry and will take chickens or other poultry that is not properly fenced in. Bird's eggs are a real delicacy and very nutritious too, so not surprisingly, foxes will take them whenever they can. A fox will bite into the egg so the whole shell is broken and then lick up the yolk and egg white off the ground. Sometimes if a fox finds an egg but isn't hungry, it will hide it under some moss, as it is too delicate to carry back to the den. In the summer and autumn, the many different fruits and berries available become a major part of the diet. In particular, cherries and plums, which are eaten whole from the ground.

#### Evidence of a kill

When a fox eats a mouse or a small bird, there is rarely much sign left of the kill. The prey is usually eaten whole. The only evidence of a kill

would be a few tufts of fur, some feathers or a few drops of blood. For bigger kills it can be equally difficult detective work. Depending on how hungry the fox is or how big the kill is, it may decide to bring the kill home to the den, leaving very little trace above ground. More often than not the fox will eat his kill above ground, leaving hints such as droppings or paw prints. However, the bones of larger animals will be discarded outside the den when the meal is finished, so that would be a good place to look to see what your foxes have been eating. Some fox foods include: rabbits, eggs, hares, insects, rats, worms, mice, fruit, hedgehogs, scraps and birds.

#### Tracks

A track is the footprint an animal leaves in the ground. Did you know that foxes have five toes on their front paws but only four on their hind paws? The fifth toe on the front paw is raised up though, so it doesn't actually show in the track. Unlike us the left and right footprint or paw print are almost identical so it can be difficult to tell them apart if you only find one print. It is easier to tell the fore and hind paws apart, as the fore paw is slightly larger than the hind paw.

When looking for fox tracks, be careful not to confuse them with dog tracks, as they are quite similar. Here is a table to help you tell the difference between them.

#### Fox Track

- Small pads (5cm in width approx.)
- Front paws are distanced from the central pad.
- All the pads are spaced apart.
- The claw marks are slender and long.
- A fox's track is more slender and elongated compared with that of a dog.



#### Dog Track

- Large pads (size variable)
- Front paws are close to the central pad
- All the pads are close together
- The claw marks are short and rounded
- A dog's track is rounder and shorter than that of a fox



#### Droppings

Fox droppings can be quite easy to recognise, so you'll know if a fox has been about. They are similar to that of a dog but are spirally twisted with a point at one end. The colour can vary between black and grey depending on what the fox has been eating. Berries in autumn give a darker colour whereas animal bones give a paler whitish colour. Fur, feather and bone fragments of small animals can be found in droppings all year round. In the summer, the hard outer skeleton of insects called chitin may be seen. Beetles are a particular favourite. Because foxes use the distinct smell of their droppings to mark out their territory, droppings will commonly be found in elevated places such as tree stumps, tall grasses or on large rocks.

#### Communication

Like all other mammals, foxes leave their distinctive smell everywhere they go. Usually this is to mark

out their territory for other foxes. The smell includes information as to whether the fox is male or female, and how old and healthy or strong it is. During the mating season foxes get particularly smelly! Scents can say whether a female is pregnant or even if she has young cubs. Scent is a very important form of communication.

#### Fox talk

Foxes have up to 20 different calls, 8 of which are just used by cubs. Foxes are actually quite quiet in that they will only call about once every five hours. Some of these calls are friendly and can be quite complex, whereas others are aggressive and much simpler. Here is a list of the 8 most commonly heard fox calls.

**Barks/ yells:** By far the most common calls. These are aggressive calls used to mark out territory.

**Shrieks:** By vixens to attract dog foxes in winter; long calls starting gradually making it easy to find the caller

**Growls:** Very like a dog's growl and also used as a threat

**High whines:** Usually follow barks

**Wow-wow barks/ staccato barks:** Multiple barks (3-6), which can be heard far away and are used for friendly communication

**Ratchet calls:** A short burst of sharp c-c-c-c-c sounds. Ritualised aggressive call.

**Yell whines:** Signifies intense submission to another fox

**Screams:** Defensive or threat calls

#### Description

Red foxes vary in colour from pale yellow to deep reddish brown, with white or pale underside. The tail is thick, long and bushy, almost always with a white tip. Fox's ears are quite long and pointed.

Body length 50-100cm

Tail length 30-45cm

Hind Foot 13-16cm

Paw length 5cm

Height at shoulder 30-40cm

Weight 4 - 9 kg

#### Range & Habitat

After humans, foxes are one of the most widespread of animals on earth. They can live in deep forest, arctic tundra, open grassland or city streets, but they prefer areas of highly variable vegetation. Their favourite place to live is in or near scrub, woodland or other tall vegetation. In cities, urban foxes prefer areas of detached or semi-detached housing with large gardens.

#### A Fox's Home

Foxes live underground in 'dens' or 'earths'. These are just like rabbit holes only bigger. In fact, sometimes a den is made from an old rabbit hole or a badger's set. Foxes usually have a number of dens within their territory. Outside of the breeding season, they may spend much of their time above ground in thick cover. During the breeding season the vixen selects a den in which to have her cubs, once born the cubs may be moved from den to den if disturbed. Many dens have only one or two entrances whereas breeding dens may have several entrances. In urban areas foxes live at higher densities than in the countryside. This is probably due to urban foxes having a more regular source of food... thanks to us! In Dublin fox densities average around 1.04 fox families per km<sup>2</sup>. In rural areas densities may be several times lower than this.

#### How to recognise a den...

Fox dens are often concealed in thick undergrowth and can be hard to

locate, unlike badger setts, which are more conspicuous. Often all that is seen of the dens are runs through the undergrowth made by foxes travelling to and from the den. In urban areas dens are usually located in dense undergrowth or neglected gardens. Often urban dens may be located under sheds or other man-made features and occasionally they are located under or even inside houses! Fox den locations in Dublin have included: gardens, sheds, compost heaps, a church basement, a utility room of a private house (amongst the laundry!) and in a scrap car in a junkyard!

#### How to tell if a den is in use...

- Stick your head a little into the entrance hole and have a good smell! If you get a sharp acrid 'carnivore' smell then the den has foxes in it.
- Look for food remains like bones and feathers spread out around the entrance. This could mean that there are young in the den.
- In good weather foxes like to do a bit of sunbathing outside the den. Look for signs of trampled grass near the entrance.
- The droppings, urine and food remains left by foxes make for very fertile soil. As a result, lots of plants will be growing nearby, especially in spring, maybe even some unusual ones that need very rich soil.
- In urban gardens fox cubs often make their presence known through collecting toys, boots and other bric-a-brac, demolishing flowerbeds and rooting up lawns.

#### Family Life

A home range is typically occupied by breeding male, a breeding female and their cubs. Often a second non-breeding female (the offspring of a previous year) will remain in the territory and help to rear the cubs. Very occasionally two females may rear cubs in the same territory or even in the same den. Males fight to defend their territory during the mating sea-

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Thanks to: David Wall, Dept of Zoology, UCD & Dr John Rochford, Dept Of Zoology, TCD

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 Issued by: ENFO – The Environmental Information Service, 17 St Andrew Street, Dublin 2, Ireland. Tel: (01) 8883911 (01) 8883933 Fax: (01) 888 3946 e-mail: info@enfo.ie web site: www.enfo.ie

# Jewels in the Mud

By Catherine Dalton

LAKES are sparkling, reflective and spectacular features in the landscape. For an island nation we are particularly well populated with lakes (over 11,000 lakes) especially along the western coast. As well as providing an important landscape feature, a source of drinking water, amenity and recreation, what is perhaps less well known is that lakes provide us with an important archive of geographical information. A small but growing number of Irish researchers call themselves palaeolimnologists, or people who reconstruct past lake environments. This archive is essentially the lake muds that have accumulated in the bottom of lake basins.

The misnomer that our lakes are bottomless has been well and truly dismissed by palaeolimnologists. The majority of lakes in Ireland have developed in the Holocene period (over the last 10,000 years) in hollows and depressions gouged out in the landscape by retreating glaciers. Profiling these geological basins is a relatively under-developed area in Irish research as is sedimentology. Much of the academic interest has centred on the water basin.

What may appear as relatively homogeneous brown mud to some contains a wealth of information to palaeolimnologists. This information is extracted from mineral, plant and animal detritus that accumulate in the mud. Mineral fragments are explored in terms of their chemistry, isotope signals and general morphology. Biological fragments contain proxy material representing aquatic plants remains (pollen, macrofossils, fossil algae, algal pigments) insects (larval and adult stages). Some remains are intact and are visible to the naked eye, others are more fragmented or are so small that they require examination under a microscope with up to x1000 magnification. The technology used to analyse materials and glean clues about past environments has advanced at a spectacular rate in recent decades. Traces of past environments can show up in mineral, plant and animal form, providing important

evidence for the palaeo-detectives. The location, abundance and condition point toward the environmental conditions under which these various life forms prospered.

Palaeolimnologists assume that lake muds have accumulated over the history of the lakes existence. Surface sediment 'cores' samples are extracted using drilling devices that are lowered by gravity on a rope into surface sediments. More sophisticated rod-based corers are operated from rafts when longer Holocene lake sediment cores are required. This raises the question about the sediment accumulation rates and the depth of lake sediment archives. The sediment archive is potentially as old as the lake. The amount of sediment extracted depends on the accumulation rate in the lake and the type of coring device used to extract the sediment. A highly productive lake is estimated to accumulate 0.5 cm of sediment annually so a 1 m core is assumed to contain c. 50 year archive. When sediment cores are extracted layers are often visible, representing different environmental conditions over time. However in the majority of lakes the sediments are relatively homogenous and require more sophisticated laboratory procedures to extract information on the catchment-lake history.

Diatoms are of particular interest to this author. Diatoms have been called 'plants with a touch of glass'. These microscopic plants are found in all lakes as well as the sea and make up about a quarter of plant life by weight and produce a quarter of the oxygen we need. Their uniquely patterned siliceous skeletons enable their preservation as 'jewels in the [lake] mud'. A Victorian hobby arranged the cells in artistic assemblages on microscope slides.

The study of lake mud had an auspicious start in Ulster with the appointment of Frank Oldfield as Professor of Geography and Dean of the School of Biological and Environmental Studies at the New University of Ulster in 1967. Frank went on to become, among other things, Executive Director of IGBP Past Global Changes (PAGES). Among his many students at Coleraine was Rick Battarbee, who now heads up a large group of lim-

nologists and paleolimnologists at the Environmental Change Research Centre in University College London. The tradition of examining lake sediments was pioneered in the south with Declan Murray in University College Dublin. More recently examination of lake sediments has been recommended as a methodology under the EU

Water Framework Directive to reconstruct past chemical and biological conditions as a means of supplementing gaps instrumental records. This recent development has fostered a wealth of research projects in the last 5 years quadrupling the number of palaeolimnologists working in Ireland.

For more information see [www.palaeolim.ie](http://www.palaeolim.ie).

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By  
Anthony Toole

# Wild Melbourne

WITH a population of some 3.3 million, Melbourne is a sprawling city. Its Central Business District is quite compact, and has been referred to as a Golden Mile. The residential area, however, hemmed in by Port Phillip Bay to the south, extends for twenty kilometres to the west and north and double that to the east. Though there are more than a dozen National and State Parks within a morning's drive of the suburbs, some of the most important work toward the protection of wildlife is done much closer to the city, and even within its boundaries.

At Werribee, on the south-western edge of the city, and covering an area of 11 000 hectares on the Port Phillip Bay coast, lies the Western Treatment Plant. This huge area was set aside in the 1890s to handle the sewage of the rapidly growing conurbation. Even today it treats the effluent of more than half Melbourne, including that of the 1.6 million inhabitants of the west, north and central suburbs and most of the city's industrial waste. Much of this is cleaned by passage through a series of lagoons, in which solids progressively settle, and bacteria, helped by aeration and sunlight, purify the water before its discharge into the bay.

The lagoons, and Lake Borrie, which was created from a small swamp, are completely artificial. Apart from the treatment areas, there are rivers, estuaries, dry plains, woodlands and mudflats. These have all been enriched by nutrients from the plant's discharges, which feed a large invertebrate population. This,



Pelicans at Werribee.

in turn, has attracted huge numbers of birds to Werribee, with the result that in 2001, the wetlands were listed under the Ramsar Treaty as of international importance.

More than 270 species of bird have been recorded at Werribee and its smaller satellite protected areas, Point Cook and Cheetham wetlands. This is almost as many as in the world famous Kakadu National Park in the Northern Territory. Bird watching and fishing are allowed all year round, but only by permit. With little human interference and no shooting, this has become a wildlife haven.

Upward of 60,000 birds arrive here in the autumn, including up to 20,000

waders. Many have migrated from Alaska, Siberia, Japan and China. Records show that some ringed birds have made the journey at least ten times. Large numbers of Australian teal, shoveller and shelduck winter here along with grebes, coots, pelicans, black swans and white ibises. Waders include red-necked avocet, pied stilt and the much rarer Cox's sandpiper, buff-breasted sandpiper and Asian dowitcher. 700 pairs of pied cormorant breed here and raise their chicks during winter. Several artificial perches have been built around Lake Borrie to replace trees that have either fallen or rotted away, making this the only breeding area for cormorants

in Victoria. Marsh harriers and white-bellied sea eagles are among the birds of prey that are often seen. About 60 orange-bellied parrots migrate to Werribee from Tasmania for the winter. This is an extremely endangered bird, with an estimated total of 150 surviving in the wild.

Werribee is no longer the sole treatment plant for Melbourne, though it remains the largest. As the city expands, there are new housing developments in the surrounding area. These have necessitated changes in sewage handling. Odours need to be eliminated. The lagoon system is being expanded. The emphasis has moved toward recycling rather than discharge. These

plans include measures to conserve the flora and fauna of the wetlands, and make Werribee a world leader in this field.

The Western Treatment Plant was originally set up to divert sewage from the Yarra River, Melbourne's main watercourse, which flows into the city from the north-east. The several wooded parks that line the riverbanks from the suburb of Warrandyte almost into the city centre illustrate its success. The purpose of some of these parks is largely recreational, while others are dedicated to quite specific conservation projects.

Warrandyte State Park lies 24 kilometres from the city centre. Scattered around its

slopes are relics of Victoria's gold rush, which began here in 1851. Mining continued into the early 20th Century, by which time around 250 miners were employed here. At Pound Bend, a tunnel was dug to divert the river and so expose its bed for mining. At the same time, the hills were completely denuded of trees. Since the closure of the mines, the area has reverted to its natural appearance and fast-growing manna gum trees have recolonised the riverbanks and hillsides. Many of Australia's iconic animals, kangaroos, wallabies, wombats and platypus have returned.

At Pound Bend, a reserve within the park has been created specifically for koalas. There are footpaths through the forest, and though the koalas may at first be difficult to spot, they can more readily be seen when one knows what to look for. The trees are very tall, and the animals, even at their most active, are almost immobile. Nevertheless, they usually appear as incongruous swellings among the higher branches of the eucalyptus.

A short distance to the west of Pound Bend is a tiny, and even more specialised protection area, the Pauline Toner Butterfly Reserve. The Eltham Copper butterfly was first recorded in 1938. Twenty years later, it was presumed extinct, but a small number were rediscovered in 1987. It is now known to be present at fewer than twenty sites at three widely separated localities in Victoria.

The numbers of this very rare butterfly are low because of the isolation of its populations, the loss of habitats and its unusual life cycle. The adults lay their eggs only on the Sweet Bursaria plant, on which the caterpillars depend for their food. In

Photos: © Anthony Toole



Werribee River mouth. The Western Treatment Plant lies beyond the far shore.



Yarra River at Yarra Bend.

their nocturnal foraging, they are accompanied by *Notoncus* ants, which feed on sugar secretions on the caterpillars' skins. In return, the ants protect the caterpillars from insect predators.

The Pauline Toner reserve is named after Victoria's first woman cabinet minister, who was an active campaigner for the butterfly. Volunteers carry out conservation work, such as revegetation, protection of habitat and track management, with financial support from Victoria's Department of Sustainability and the Environment.

As everywhere in Australia, the Aboriginal names have been overlaid with later appellations that reflect the origins of the European settlers. So the Yarra snakes its way between the suburbs of Doncaster and Heidelberg, and

past an almost unbroken series of parks and reserves, before it comes to the Yarra Bend Park, where a unique and highly successful experiment has been carried out.

For two decades, fruit bats, also known as flying foxes, inhabited the Royal Botanical Gardens in the centre of Melbourne. As their numbers approached 30 000, the damage they did to the trees became devastating. As the species, on a national scale is threatened, culling was not an option. Relocation was the only solution. In an operation that was the first of its kind in the world, the bats were moved to a site at Horseshoe Bend, farther up the Yarra. When they tried to return, or invade nearby residential gardens, they were subjected to noises which drove them back.

Over a six-month period, they moved five kilometres downstream and eventually settled at Yarra Bend.

An area of 26 hectares has now been allocated as a flying fox reserve, and the vegetation there will be continually regenerated until it, and the bats reach a sustainable level. An almost identical problem has arisen in Sydney, so the pioneering work in Melbourne is now being seen as offering a possible solution.

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

Photos: © Anthony Toole



Fruit Bats (Flying Foxes) at Yarra Bend.



A close-up of the fruit bat.



Koala, Pound Bend Reserve.

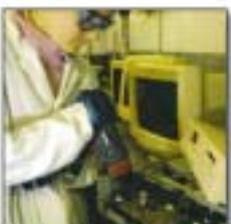
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# Recent EPA publications

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ISBN: 1-84095-206-7

ERTDI Report No. 55: Identification of Reference – Status for Irish Lake Typologies Using Palaeolimnological Methods and Techniques (IN-SIGHT)  
ISBN: 1-84095-211-3

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ISBN: 1-84095-226-1

2020 Vision. ISBN: 1-84095-227-X

See Something? Say Something! – Leaflet

Many of these publications can be downloaded free from the EPA website [www.epa.ie](http://www.epa.ie)



Visit

[www.naturesweb.ie](http://www.naturesweb.ie)

Download an exciting newsletter for children, featuring interesting and informative news on nature and the environment.



Produced by Sherkin Island Marine Station

# PUBLICATIONS OF INTEREST



## The Historic Countryside of the Saxon villages of Southern Transylvania

John Akeroyd  
Fundatia ADEPT, Saschiz, Romania. Pp. 86, with many colour photos

ISBN (10)973-0-04533-X  
(13)978-973-0-04533-8

Available from Fundatia ADEPT, 32 Oakley Road, Chinnor, Oxon OX39 4HB

Price: £12.00 incl. p&p/2006

This beautifully illustrated book introduces the historic Saxon Villages of southern Transylvania in Romania. Here in the foothills of the Carpathians there survives a medieval landscape, a remarkable place of remote villages, ancient forests and flower-rich hay-meadows, all of huge scientific, cultural and human value. The author pleads for old and new to be combined in a sustainable economic future, with farming, quality food production, traditional crafts and eco-tourism at the heart of sustainable development and conservation. This book is for visitors and anybody interested in European botany, natural history, conservation and human history; a Romanian edition goes out to schools and government offices.

## Nature Guide to the Aran Islands

Con O'Rourke  
The Lilliput Press  
[www.lilliputpress.ie](http://www.lilliputpress.ie)  
ISBN 1 84351 078 2  
Price: €15.00/2006

Ireland's offshore islands are unique places to visit. The Aran Islands off the west coast are the most famous. Much has been written about their literature, social history, folklore and language but little of their natural history. This book by Con O'Rourke will help greatly to focus on the island's natural history. The chapter on flora has lovely photographs of the plant life of some of the 437 species found on the islands. The history of botanists on Aran makes interesting reading. The greatest botanists of the late 19th century and the early 20th century were visitors - Hart, Colgan and Praeger. Colgan identified 419 of the above 437. In the late 20th century, Webb, and the outstanding Maura Scannell from the National Botanic Garden, also visited the island. There is a chapter on the fauna of the islands in which the photographs of the birds, and especially the butterflies and moths, stand out. Other sections

include geology, climate, seashore and farming. If I were to visit the Aran Islands again, I will not be without this wonderful guide.

## Depend on Nature Ecosystem Services supporting Human Livelihoods

Sue Mainka, Jeff McNeely, Bill Jackson  
IUCN

Available for downloading on [www.iucn.org](http://www.iucn.org)

Price: £8.50stg/2005

Human wellbeing depends on the capacity of the earth's natural systems to provide ecosystem goods and services. We rely on ecosystem services to provide the basics of life - food, water, shelter, clothing and clean air - and to regulate our climate, to pollinate our crops and to inspire our societies and cultures. Yet, at the same time, the biological diversity that delivers these services is being lost.

This 37 page book lists and discusses ten actions and their first steps for achieving development goals through environmental management. They include:

- Integrated ecosystem management for human wellbeing into development planning and implementation.
- Promote equity, especially gender equity, in natural resource management.
- Explore and support payments for ecosystem services.
- Ensure at least minimum environmental flows in all water management schemes.
- Restore landscapes and seascapes to benefit people and nature.

## Marine Habitat and Cover Their Importance for Productive Coastal Fishery Resources

By John F. Caddy  
Oceanographic Methodology Series UNESCO Publishing  
<http://publishing.unesco.org>  
ISBN: 978-92-3-104035-1  
Price: €26.00/2007

This book addresses a large but poorly-defined area, namely the application of field studies in marine ecology to the assessment and management of demersal fisheries. It argues that when fishery resources are depleted harvest controls alone are ineffective for their recovery and subsequent conservation. The author addresses fundamental issues that fishery scientists should have

given priority to investigating over the past 50 years. They include: Damage to structurally complex habitats and benthic habitats, changes to coastal environments from the effects of fishing or land runoff, habitat cover availability and natural mortality, as well as the influence and role of the cover. Many issues for the betterment of fish stocks are discussed. Bottom fishing and its impact on habitat, Marine Protection Parks, artificial structures and restoring a productive marine environment. The comments made in the foreword by Prof. Quifiones of the Centre for Ocean Researches in Chile are very much to the point. He states that the author is drawing our attention to a key factor for the proper management of benthic and demersal populations/communities that until now has not been properly accounted for - the importance of habitat and cover. This book is highly recommended, especially for fishermen, fisheries managers, scientists and decision-makers.

## Proceedings of the Workshop Stream Building a Secure Financial Future: Finance & Resources

Vth IUCN World Parks Congress  
Durban, South Africa, September 8-17, 2003  
IUCN  
[www.iucn.org](http://www.iucn.org)  
ISBN: 2-8317-0842-7

Price: £9.00stg/2003

The Sustainable Finance Stream (SFS) of the Vth IUCN World Parks Congress set the stage to better understand the value of biodiversity, the costs of conserving it, and what needs to be done to secure its financial future. Critical to this effort is the cost of managing protected areas.

A particular challenge identified throughout the Congress is that of communication. Services provided by protected areas are not fully understood, identified, and appreciated. Building solid institutional arrangements for financing protected areas is essential.

A number of regional case studies from different parts of the world stress the financial challenges of managing conservation programs, and demonstrate the potential to successfully develop sustainable financing mechanisms. Experiences also suggest that well-executed analyses of social and economic benefits of biodiversity conservation can convince

the private sector policy-makers, and governments of the importance of investing in protected areas.

## Value Counting ecosystems as water infrastructure

By Lucy Emerton & Elroy Bos  
IUCN  
[www.iucn.org](http://www.iucn.org)  
ISBN: 2-8317-0720-X  
Price €10.50/2004

This practical guide explains the most important techniques for the economic valuation of ecosystem services, and how their results are best incorporated in policy and decision-making. It explains, step by step, how to generate persuasive arguments for more sustainable and equitable development decisions in water resources management. It shows that investments in nature can be investments that pay back.

Ten key messages are put forward. They include:

- Putting ecosystems into water equations
- Correcting the balance sheet
- Adding up the benefits and costs
- Using valuation in water decisions
- Improving standard planning practices

This book should be on the shelf of planners, water engineers, in fact anyone involved in decision making where water or habitats are concerned.

## Nature Conservation Concepts and Practice

Edited by Dan Gafta & John Akeroyd  
Springer Berlin Heidelberg  
New York  
[www.springeronline.com](http://www.springeronline.com)  
ISBN: 978 3-540-47228-5  
Price €200.00/2006

The proceedings of an international conference held in Cluj, Romania, in 2005, this volume brings together papers on the conservation of species, habitats and landscapes in Europe and worldwide. Topics covered include studies of flora, fauna and ecological history for the evaluation of biodiversity, and multi-disciplinary ecology as a tool of conservation.

The book emphasizes links between widely different fields of research and between science and the wider community. It will be of great value to those who practice and teach nature conservation, to landscape architects and town planners.

# Limerick Nature Walks

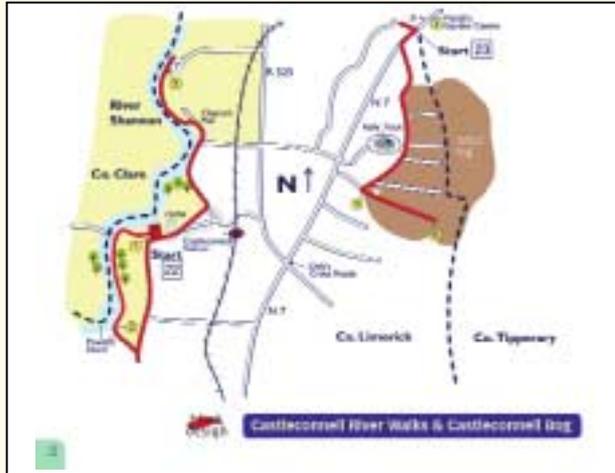


Illustration: © "Limerick Nature Walks"

WHEN will most people realise that just a few miles from their home the world of nature is waiting for them? There is no doubt that quite a few residents of Limerick city and county do not realise the true beauty of their own county - and indeed this can be said about residents of every other county in Ireland. The saying "far away hills are greener" would sum up the insane rush to foreign parts for holidays. But there is real beauty waiting just outside our doorsteps and this book shows us just a fraction of it.

It describes 35 nature walks within the boundaries of County Limerick. They include the Barnagh Tunnel, Foynes Wood and Murroe Woodland. A map is provided for each walk, giving its location within the county, the distance of the walk, the best place to begin and how long it would take - based on a person walking 4km per hour. Within each walk



Castleconnell Riverwalk

description, the author mentions various species of animals and plants that the walker should be on the look out for. The final section of the book has lists of birds, butterflies and dragonfly species that were recorded in Limerick. The wildlife photographs in the book are

wonderful and the colour maps for each walk are superb.

This is a wonderful book and it should be a must for every school in Limerick County and beyond. By getting children interested in these walks they can, as only children can, get their parents out and about. Limerick Nature Walks is a template for a similar book for each county in Ireland. *(Matt Murphy)*

**"Limerick Nature Walks"**  
 by Geoff Hunt. ISBN: 0-9540545-2-0  
 Published by Gaelscoil O Doghair  
 2006. Available from Newcastle West  
 Bookstore Ltd, Market Yard, Newcastle  
 West, Co Limerick. Price: €20.00.  
[www.newcastlewestbookstore.com](http://www.newcastlewestbookstore.com)

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# Calling all Radio Officers

THE RADIO OFFICER, known to generations of seafarers as "Sparks", was an integral part of life on board ships in the days before satellite communications rendered the job obsolete.

Guglielmo Marconi - the first Radio Officer, was the originator of the wireless communication system.

On board ship, he or she had to operate the radio transmitter, direction finder, echo sounder and radar, and quickly repair anything that went wrong with this equipment.

Radio Officers first went to sea in merchant ships in 1900 and for almost a century they provided a vital link between ship and shore. The Radio Officer became recognised as an indispensable part of ensuring the safety of life at sea following the Titanic disaster of 1912.

The Radio Officer continued to provide safety and commercial radio communications and radio, radar and electronic maintenance duties onboard merchant ships until late 1990's but the advent of satellite GMDSS (the automated Global Marine Distress and Safety System) ensured that the demise of the specialist officer for communication was inevitable.



## Radio Officers' Association

The main purpose of the Radio Officers' Association is to ensure that the work, life and times of the Marine, Aeronautical, Coastal Stations and Clandestine Radio Officer are not forgotten.

In slightly less than 100 years the marine Radio Officer came and went but during that time many thousands of men and women enjoyed a challenging, enjoyable and truly unique profession. The Radio Officers' Association was formed in 1995 to ensure that these experiences are not forgotten.

This contribution to life at sea is being recorded for posterity and the Association does so in an exemplary way.

The Association publishes a quarterly newsletter called QSO, which generally comprises of a booklet of information about past and forthcoming events, sea stories and memories together with details of current communication systems. It also includes an update of association documents, former Wireless College news, book reviews, letters to the editor and much more.

Membership of the Radio Officers' Association is open to suitable qualified serving or former Radio Officers of the Merchant, Coast Station, Civil Aeronautical or Covert services. Tom Frawley and Colman Shaughnessy would like to make contact with former Merchant Navy Radio Officer and any other Irish Radio Officers.

Website: [www.roass.org](http://www.roass.org) Email: [tom.frawley@gmit.ie](mailto:tom.frawley@gmit.ie)  
[shaughnessy@eircom.net](mailto:shaughnessy@eircom.net)

# Junior Pages

## Planning a Seashore Safari . . .

### A Trip to the Seashore

The rocky seashores around our coast offer a chance to see a dazzling variety of animals and plants to those who will only take the time to look. The seashore is also full of examples of how animals and plants adapt to a wide range of changing conditions as the tides come in and out.

Teachers will also find a number of excellent printed guides and websites devoted to making seashore ecology simple and interesting to teach. So that a trip to the seashore can fit perfectly as an example of "local habitat" when teaching the SESE curriculum.

Over the next few issues of *Sherkin Comment* I will give you an outline of what you need to know, either as a teacher, a pupil or simply a person interested in a fascinating day out on the seashore.

### When to go

The best time to visit the seashore is an hour before the low Spring Tide. Spring tides occur every two weeks and bring with them the lowest low tides, exposing as much of the shore as possible. Their time and dates can be determined from tide tables published in local newspapers or purchased on angling and yachting shops. By visiting the shore an hour before Low Spring Tide you will experience the water dropping to low tide, turning and rising again, making the best use of your time on the shore.



### Planning for Safety on the Shore

You will need waterproof boots and warm clothing in winter or old shoes that can get wet in summer. Teachers will need a whistle to call their class together and need to observe the standard pupil/teacher ratio for a field trip. A mobile phone is also a useful safety item.

Finally you will need a wooden frame of standard size to compare the number of animals and plants up and down the beach, notepaper, buckets, nets and a simple magnifying glass.

Captain  
Cockle's  
Log



Words & pictures by John Joyce  
[www.cockle.com](http://www.cockle.com) © John Joyce 2007

### UPPER SHORE

Land plants  
Sea Hollies  
Sea Pinks

### SPLASH ZONE

Lichens

### MEAN HIGH WATER

SPRING TIDES  
Channelled and  
Spiralled Wracks

### Mid Shore

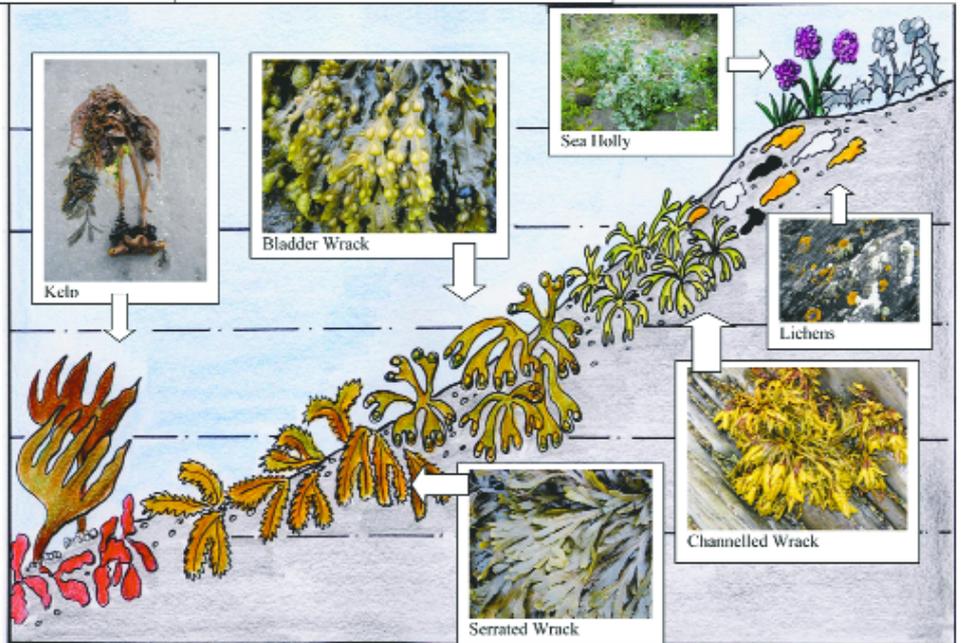
Bladder wrack

### MEAN LOW WATER

NEAP TIDES  
Serrated wrack  
Red seaweeds

### MEAN LOW WATER

SPRING TIDES  
Kelps



### Books and websites:

*A Beginner's Guide to Ireland's Seashore*

From Sherkin Island Marine Station

In all good bookshops or online from:

[www.sherkinmarine.ie](http://www.sherkinmarine.ie)

Also, the DVD "On the Water's Edge"

Features animals, plants and a guide to the seashore, also available from Sherkin.



### Seaweeds

The most obvious living things on the seashore are plants, which range from land plants like Sea Holly and Sea Pinks at the top of the shore, through lichens ( a cross between an algae and a fungus, down to the true algae – Wracks, Kelps and red seaweeds at the bottom of the shore.

Make a note of which types grow where on the shore, or make an accurate count from low tide to high tide using your standard frame and a measuring tape.



# "Trout in the Classroom"



Children releasing fry.

## By Des Chew

THERE was great excitement in Mulhuddart National School and Scoil Olibhre primary school recently as both Dublin schools took part in the DAI (Dublin Angling Initiative) 'Trout in the Classroom' project. This special project allows children, under supervision, to rear trout eggs in their school. The practical nature of this project brings the subject to life for children and they all have a role to play in ensuring the eggs reach maturity and are released into the wild.

Trout farming and egg rearing is a complex process, for even the most experienced fish farmer. In order to ensure success, the water temperature must be regularly monitored, the eggs (or ova) must be protected from natural light, a constant flow of water and oxygen and the continuous removal of dead eggs and any debris which may encourage fungal growth and destroy the eggs must be carried out.

In spite of these challenges, the children in both schools managed to rear over 600 trout fry successfully with very few casualties. The eggs were donated by the Central Fisheries Board Trout Fish Farm in Roscrea, Co. Tipperary and were delivered to the schools in late November 2006 by Des Chew of the Dublin Angling Initiative. The aquariums which were donated by Pet Stop in Blanchardstown town centre were already in place awaiting the arrival of the eggs. The project involved numerous visits to the schools where children learned all about their local river, the Tolka, and the life cycle of the trout and salmon. Each child received a booklet and a fish species brochure that was produced by the Eastern Regional Fisheries Board, with puzzles and colouring games to assist with this educational programme.

The children took turns placing bot-

tles of frozen water into the tank twice daily to keep the water temperature below 10 degrees, while others removed the dead eggs with a turkey baster! Some children and their parents came to the school every day during the Christmas holidays to continue to monitor the eggs just as would staff in any fish farm.

There was great satisfaction and personal achievement watching the eggs change and develop and then on the 28th December 2006, the young fry started to hatch from their eggs with the egg sac attached to their bodies. The monitoring of water temperature and removal of the debris continued up until Tuesday 16th January when the two schools came together on the banks of the river Tolka to release the fry which were now free swimming and had fully absorbed the sac so that the trout fry could live their life in the river Tolka.

The project gave the children a wonderful awareness of their local river and gave them a degree of ownership and responsibility for the welfare of the river. They recorded all the data as they went along, times, dates, temperatures etc. More than 110 children were directly involved and attended the release of the fry into the river Tolka at Mulhuddart.

Last year, this section of the river benefited from major spawning enhancement development work where gravel beds were created and resting or holding pools were dug out to improve the trout habitat. This work was carried out by Fingal County Council and the Eastern Regional Fisheries Board. On the day of release, rangers from the Tolka Valley Park, fisheries officers from the Eastern Regional Fisheries Board, youth workers from Foróige Youth Project, members of the Tolka River Environmental Alliance and teachers from both schools were present to support the initiative.

Six schools in the Tolka Valley catchment area are already booked to



A group shot of participants in "Trout in the Classroom".

participate in this project for 2007. The idea for the project came from Philip Jennings from Blanchardstown Youth Service and the programme was run by Des Chew of the Dublin Angling Initiative. Well done to everyone who took part in this special project, especially the children.

For further information on the education projects carried out by the Dublin Angling Initiative and the Eastern Regional Fisheries Board, please visit [www.fishingireland.net](http://www.fishingireland.net)

## 2007 International Blue Flag Beaches in County Cork

The International Blue Flag campaign is a voluntary scheme co-ordinated in Ireland by An Taisce – The National Trust for Ireland, with support from the Department of the Environment, Heritage and Local Government and on behalf of the Foundation for Environmental Education (FEE, [www.fee-international.org](http://www.fee-international.org)).

This International award is universally recognised as the benchmark for beach quality. It ensures the following Beach Quality criteria are maintained:

- excellence in water quality and a committed monitoring programme
- Provision of adequate safety and services, safety equipment and warning signals of potential hazards.
- Beach Management programme, Good Infrastructure, accessibility and litter control.
- Provision of environmental information and education

This year Cork has been awarded 10 Blue Flag Beaches. These awards reflect the work carried out and the continued commitment by the Councils local area offices, Environment Department and Voluntary Community Groups.

◆ Youghal	Front Strand Claycastle
◆ Shanagarry	Garryvoe
◆ Old Head of Kinsale	Garrylucas Garrettstown
◆ Clonakilty	Inchydoney
◆ Rosscarbery	Owenahincha The Warren
◆ Skibbereen	Tragumna
◆ Mizen Head	Barleycove

### For further information :

- > on issues of beach management and water quality contact the environment section, cork county council 021- 4532700 [www.corkcoco.ie](http://www.corkcoco.ie) or local area office.
- > For information on Blue Flag Beaches contact: An Taisce Blue Flag Office, Tailors Hall, Back Lane, Dublin 8. tel 01- 7077068 [blueflag@antaisce.org](mailto:blueflag@antaisce.org) [www.blueflag.org](http://www.blueflag.org)
- > On issues of information regarding special protection areas, natural heritage areas contact Heritage unit, Cork County Council 021-4818006
- > On issues of water safety contact [www.iws.ie](http://www.iws.ie)

### LEAVE YOUR FOOTPRINTS ON THE SAND AND NOT YOUR WASTE.

The Blue Flag Operators in Ireland urge the public to help retain Blue Flags at beaches by doing some simple things when visiting the beach. On your next beach visit:

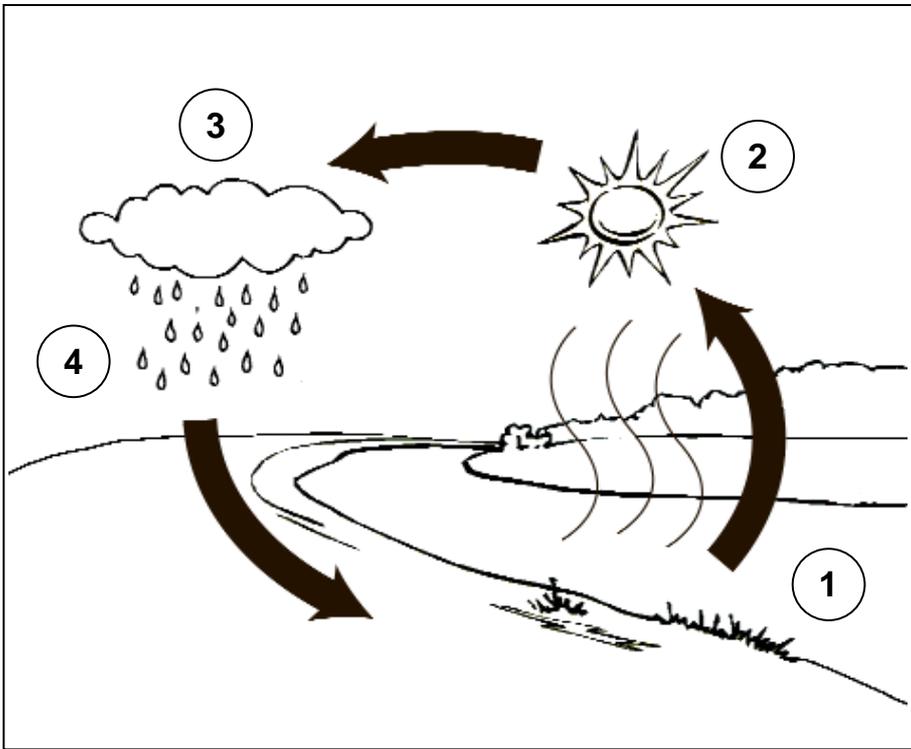
- Stay safe. Know your flags. Look at the safety signage and follow your lifeguard's advice.
- Respect the fragile beach habitat, particularly the sand dunes. Sand dunes are a very important natural ecosystem and coastal defence system. Please do not trample the dunes – use footpaths and designated pathways. Driving, motorcycling, scrambling and horseriding destroy the dunes. Please try and prevent these activities.
- Follow the beach code of conduct.
- Use litterbins if provided or better still Bring Your Litter Home with you!
- Recycle at the local facilities provided. Follow the signage.
- Keep dogs on a leash and clean up after your dog
- Respect other beach users.
- Join in beach clean/activity days or organise your own if you have the initiative.

The Blue Flag award has benefits to the local community, where amenities and environment are enhanced and a shared responsibility for the beach and the local environment is promoted. These awards also have a positive knock on effect for tourism in the County. The local authority depends on the full co-operation of the public in maintaining and progressing the Blue Flag Scheme along our beautiful coastline.

IT'S A GREAT DAY TO BE AT THE BEACH!

# The Water Cycle

Can you put the correct number in each box on the right?



## CONDENSATION

When rising water vapour hits the cold air in the sky, the vapour turns into liquid, forming clouds. This is called condensation.

## EVAPORATION

The sun heats up water in rivers, lakes and oceans, turning water into steam or vapour. This steam rises and goes up into the air.

## PRECIPITATION

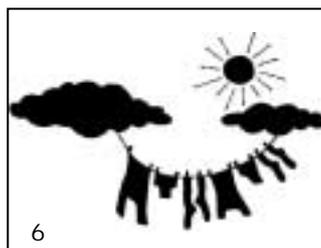
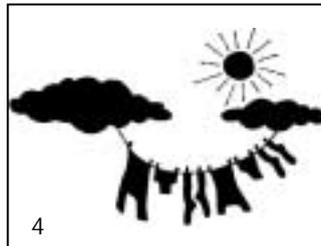
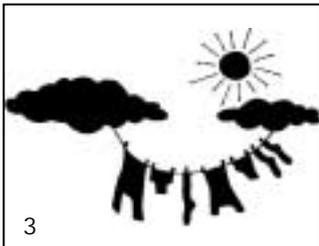
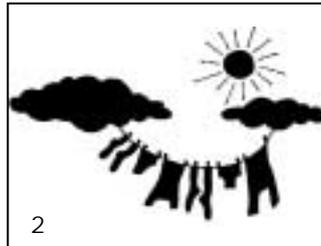
Precipitation occurs when so much liquid has collected in the clouds that the air cannot hold it any longer. The water falls back to earth in the form of rain, hail, sleet or snow.

## COLLECTION

Water from the clouds may fall back into rivers, lakes and oceans, or fall on land where it soaks into the earth and collects under the ground. This water may seep into rivers, lakes and oceans, beginning the water cycle again.

# Fair Weather

Which silhouette matches the picture in box 1? (Answer below)



# WEATHER QUIZ

Each sentence below contains a hidden word, one of which is shown. Fill these words into the grid on the right and then unscramble the highlighted letters to reveal an item that takes advantage of fine weather!



1					
2					
3	W	I	N	D	
4					
5					
6					
7					
8					
9					
10					
11					

- The farmer cut the wheat in the field.
- I met Laura in the restaurant.
- A pantomime is a show in December.
- From the attic loud noises could be heard.
- The weather seems unusual at present.
- Mary put new arm patches on my sweater.
- My brother made waves in the swimming pool.
- I celebrate my birthday in May.
- The room is too stuffy.
- The gruff ogre live alone in the castle.
- The dog is lost or maybe it is just hiding?

ANSWERS: THE WATER CYCLE: 1. Collection; 2. Evaporation; 3. Condensation; 4. Precipitation. FAIR WEATHER: Silhouette No. 4. WEATHER QUIZ: 1. heat; 2. rain; 3. wind; 4. cloud; 5. sun; 6. warm; 7. dew; 8. ice; 9. mist; 10. fog; 11. storm. Item: Washing Line.

# GAISCE

## The President's Award in Third Level Education

By Eunan Mc Entee

### Why I decided to take part in Gaisce - The Presidents Award?

WHEN you start college in first year you immediately get caught up in the social way of life, which takes up a huge amount of your time. When I got as far as third and fourth year I started to realise the opportunities I had missed out on in my first years at college. You have an amazing opportunity to experience different things in college.

After talking to Letterkenny Institute of Technology (LYIT) Gaisce leader Hannah Glackin, I decided to join the Gaisce society. The Presidents Award was set up in 1985 for young people between the ages of 15-25. Each participant has to complete tasks of their choice in four different categories; Personal Skill,

Physical Recreation, Community Involvement and Adventure. You choose from three award levels Bronze, Silver or Gold. I had all ready completed my Bronze award in school so I decide to do my Gold award.

### Adventure

I went with eleven students from Letterkenny IT on a voluntary trip to Thailand. Over the sixteen days, the group was invited to work with people suffering from HIV and Aids. In Thailand, these people are often left homeless and lacking adequate care due to a lack of knowledge about the condition. Upon landing in Thailand, the group was brought to 'The Camilain Centre', where they were given a tour of the facility by Father Giovanni who has worked tirelessly to improve the living conditions of the local people. This is one of three rehabilitation centres he has set up in the region of Rangong. During the trip, the eleven stu-



Eunan McEntee during his trip to Thailand.



One of the group working on the roof.



The construction group taking time to pose for the camera.

dents were divided into two groups. One group assisted with the construction of accommodation while the other was responsible for educating the local people on how to preserve their dwellings. The construction group built a flight of steps leading down to a lake, which acts as an aquarium. They also built a pigsty in order to house more pigs for meat for the people and also for selling on.

Overall, the group found their time in Thailand to be a truly enjoyable and life-changing experience. They would like to pay tribute to all those who supported them and worked hard behind the scenes, in particular Dolores Carriwick. Due to public generosity, the group was able to donate €1500 to the housing project, €3000 for the 'Jack and Jill Foundation' and €1000 to Father Giovanni to cover the cost of medication in his rehabilitation centres.

### Personal Skill

I was always interested in music with a special love for traditional music. I have attended The Fleadh Cheoil na hÉireann every year for seven years now. I play the drums and a friend Sean Mc Cague encouraged me to take up the Bodhran. I got lessons and fell in love with playing in sessions with friends. I feel very privileged to have played along some of the most talented musicians in Ireland.

### Physical Activity

I took up canoeing and surfing for this section of the Award. It took a lot of hard work and commitment to get to a level where I could actually enjoy the sport. Now I often go out surfing and canoeing trips around Donegal, mighty craic!

### Community Involvement

I was a member of the Students Union in LYIT and it was my mission to make clubs and societies a real success by creating a wider spectrum of activity to attract students that wouldn't usually get involved. I believed that retention could also be tackled by getting people involved in different aspects of college life. First year students are less likely to drop out if they were involved in a club or society.

To sum up the Gaisce society has in a way changed my life giving me the opportunity to take up new hobbies and experience new things, a life changing experience, what more can I say. Thanks. Get involved with Gaisce if you get the opportunity.

*More information from: Gaisce - The President's Award, The State Apartments, Dublin Castle, Dublin 2. Tel: 014758746  
Web site: [www.p-award.net](http://www.p-award.net) or [www.gaisce.ie](http://www.gaisce.ie)  
E-mail: [mail@p-award.net](mailto:mail@p-award.net) or [info@gaisce.ie](mailto:info@gaisce.ie)*

# Why support the RNLI - the facts

THE purpose of the RNLI is to save lives at sea in the Republic of Ireland and the UK.

Frightened, exhausted, in a battered yacht being tossed about by high seas, a sailor makes a desperate mayday call.

Days later, he and his crew will think about how they survived their ordeal. They will remember the glimpse of an orange and blue lifeboat; her crew members risking their lives amid huge waves to leap aboard. They will remember being taken to the safety of the lifeboat and the feeling of relief that washed over them.

And they will know that those RNLI volunteers saved their lives.



- The RNLI has been making rescues like this since 1824, and over the years the lifeboats have saved more than 137,000 lives. The RNLI is a charity and therefore relies on generous donations and people raising money to make sure the lifeboats can keep saving lives.
- The RNLI's brave and selfless crews are prepared to risk their lives every time they get a shout. The call can come day or night and they have to be ready, 24 hours a day, to drop everything and head to the lifeboat station.

### The lifeboat service

- In 2004 the lifeboats launched 7,656 times - that's about 21 times every day.
- That's 21 dads, mums and children who were rescued and brought back safe and sound to worried families.

### Who do they rescue?

- People on the beach who get swept out to sea, sometimes on a lilo or a rubber dinghy, or swimmers and surfers who get caught in rip currents.

- People on powerboats and yachts, kitesurfers, jetskiers, windsurfers, fishermen, sailors on merchant vessels like cargo ships.

### Crew training - train one, save many

- Did you know that more than 90% of new RNLI volunteers don't come from sailing backgrounds?
- RNLI crew members come from all walks of life - doctors, metal workers, shop assistants, graphic designers, firefighters, translators, hair-dressers and librarians...
- But what RNLI crew members all share is the willingness to risk their life to save someone who's in danger.
- It's only training that turns someone who wants to save lives into someone who can.
- The RNLI believes their crew members deserve the very best training. It costs £1,000 a year to train a crew member, which is why they need your help to raise money.

### Teamwork

The RNLI depends on people who offer their time and energy for free. As well as the lifeboat crews, there are shore helpers who help launch the lifeboat and take it back to the station. There are people who look after the lifeboat sta-



tions and others who help raise money. This means the RNLI is a big team and everyone has an important part to play. All these people give something back to their local community.

### Why we need your help

Training for one crew member costs £1,000

Plus the all-weather lifeboat crew kit:

Gloves	£20
Boots	£40
Trousers	£205
Jacket	£235
Safety helmet	£180
Lifejacket	£500

By helping them raise money, you'll be helping to support their brave crew members. *Now there's nothing stopping you!*

### Find out more at [www.rnli.ie](http://www.rnli.ie)

Registered charity number CHY2678 (RoI) 209603 (UK)

Reproduce from the RNLI Fact Sheet "Why Support the RNLI - the Facts"



## "Butt Cigarettes are Litter Too"

*Cigarette butts are non-biodegradable.*

*Please dispose of them responsibly.*



**Department of Environment, Heritage and Local Government, Custom House, Dublin 1.**  
[www.litter.ie](http://www.litter.ie)

# Buddy, can you spare a glass of water?

By Mike Ludwig

THE availability of water regulates where populations inhabit the land. Unfortunately, water is limited by nature and geology. In fact, the United Nations has deemed the need for drinking water the 21 Century's most pressing problem. Whether it is the US, Europe, Egypt or China, obtaining water has created unexpected consequences for humans and our environment. For instance, the Rio Grande / Rio Bravo del Norte Watershed that forms the southwestern border between the US and Mexico is so used that the Cities of Brownville and Matamoros on the Gulf of Mexico cannot rely on the River for drinking water (In 2001, the flow petered out before reaching the Gulf!). No longer can these Cities get drinking water but must instead pay to drill wells or install desalination plants. In Egypt, the construction of the Aswan High Dam has altered agriculture practices, increased disease occurrence and altered the quality of life of people above and below the dam. While these "water rights" conflicts are between humans, what of the environmental "costs" associated with redirecting water from natural systems to ones designed for human use? In the Pacific Northwest of the US the use of Columbia River water for irrigation has been curtailed in favour of providing humans and fish with sufficient flows to meet their needs. Crops are damaged by the lack of water. In parts of Europe, water use has been regulated for fish protection but now human needs and wastewater dilution are causing stresses that threaten those practices. Will the fish survive? As humans need and use more water, we are seeing that the water can actually be cleaner at release but it is being put in places

where aquatic resources don't benefit and may even be harmed by the discharges.

One of the easiest solutions to water shortages is redirection from one location to another. The Romans left some of the earliest evidence of this practice with their viaducts and other plumbing devices that redirected water to Rome. Today, virtually every large City imports water from varying distances and sources. But, as the saying goes, it's not nice to fool Mother Nature. Perhaps one of the most troubling consequences of our increasing reliance on water from outside a watershed is the impacts to the natural systems. Water relocations have a variety of impacts but at the largest scale it is the effect on flows in the donating and receiving waterways that are the most troubling. Reduced water flows in the drained system mean its characteristics are changed and at its mouth, the estuary diminished. One of the worst consequences can be an increased encroachment of salt water and an altered mixing zone. Those changes, in turn, can alter sediment and pollutant deposition or erosion, habitat types and availability (functions and values), flushing, and salt-water intrusion to upriver water supplies.

Conversely, the addition of large volumes of used freshwater to otherwise established estuaries can alter mixing characteristics and the length of river in which the natural estuarine processes occur. The daily, 1.8 Billion gallons of wastewater discharged from New York City is taken from rivers throughout the State and even the Delaware River in Pennsylvania. The concentrated discharge of so much tainted freshwater in such a short reach of waterway interrupts the natural estuarine mixing processes and destroys valuable habitat for aquatic resources. These impacts have damaged the way aquatic resources live in



The Rio Grande River with the Sandia Mountains behind.

the rivers. Clearly, the tainted wastewater diminishes habitat functions and values but a City of sixteen million people has sanitation needs.

What to do? (1) In the US, before relocating water, conservation and plugging leaks have saved billions of dollars. (2) Withdrawals are timed to periods when flows of freshwater are at their peak. In New York they use "High flow skimmers" to take fresh water from rivers during heavy winter and spring rainfalls. Since the excess water would simply flow to the sea, the removals can be a small percentage of the total flow and impacts are minimised. (3) They use natural conditions to set limits on the volume of water removed and (4) If none of the above do the job, New York taps as many waterways as possible and takes as little as possible from each river. Even with all these measures, New York is experiencing water rationing and the problems will worsen as global climate change advances. New York's problems are representative of those in Los Angeles, Seattle, Miami, New Orleans and Cleveland.

Whatever the choices, take the time to invoke all the water conservation options and address the potential adverse impacts of water relocations. Those steps can do much to maintain healthy ecosystems.

*Mike Ludwig, Ocean & Coastal Consultants, 35 Corporate Drive, Trumbull, CT 06611, USA.*



**Central Fisheries Board**  
An Priomh-Bhord Iascaigh

## The Water Framework Directive

### WHAT IS THE WATER FRAMEWORK?

The Water Framework Directive (WFD) is a European Directive introduced in December 2000 establishing a new framework for the protection and management of water resources throughout the European Union.

### WHAT DOES IT MEAN IN THE IRISH CONTEXT?

The objective of the WFD provides for "the protection of the status of all Irish waters (i.e. no deterioration to be allowed) and the achievement of at least good status by December 2015".

### WHO WILL BE ADMINISTERING THE WFD IN IRELAND?

In Ireland the Directive is administered nationally by the Department of the Environment, Heritage and Local Government through the Environmental Protection Agency. Implementation will be advanced by the seven River Basin management groups.

### WHO WILL DELIVER THE FISH ELEMENT OF THE WFD?

The Central Fisheries Board is delivering the fish element of the WFD and will compile information about the fish species occurring at certain specified locations, their abundance and age patterns. The CFB will be working closely with all stakeholders including Regional Fisheries Boards, Fishery Owners, Angling Associations, Fisheries Representative Bodies and other Government Agencies.

### HOW WILL THE CFB DELIVER THE FISH ELEMENT OF THE WFD?

Stock surveys will be conducted on short sections of certain rivers, in some lakes and estuaries. The work will commence this year using standard European methods. Work will progress on a three year rolling programme (one third of sites will be assessed each year).

### WHAT IS THE TIMESCALE FOR THE FISH MONITORING ELEMENT OF THE WFD?

The details regarding fish stocks must be included in a report to Europe covering the period 2007-2009.

### WHAT IS THE PURPOSE OF FISH MONITORING?

The information obtained from the fish monitoring programmes will be used to evaluate the measures introduced to protect and restore waters.

### All enquiries to:

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