



SHERKIN COMMENT

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INSIDE

Forests in the Sea

The Fascination of Mangroves

RHODODENDRON

The major conservation concern for Killarney National Park

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Ireland's 19th Century Field Geologists



Contents

Editorial: Dioxin Emissions from the Burning of Household Waste2
 Matt Murphy comments on the latest EPA report on dioxins.

Birds of the North Wicklow Coastal Marshes3
Oscar Merne talks of a place for which he has had a great fondness for many years.

Greening the urban landscape4
A number of innovative environmentally friendly building projects are looked at by Judy Jones.

Sacrificial Beach Nourishment5
Michael Ludwig discusses the practice of putting sand on eroded beaches to recreate or expand them.

Rhododendron.....6
Chris Barron tell us how these invasive plants have become quite a problem in Killarney National Park.

Time to change - The Future of Fisheries Management7
Fishermen lead the way in conservation.

Geological Mapping: Ireland's 19th C Field Geologists8
Enda Gallagher tell us about the history of Irish geological mapping and those who carried it out.

Flowers of Ireland10
Daphne Mould looks at some of our well-known flowers and tells us about their names and habits.

The Deconstructionists.....11
A company in the US that recycles housing materials gives us food for thought.

The Race to the Destruction of the Marine Fisheries - The Argentine Case12
Argentina's doomed fishing industry is outlined by Prof. Enrique Balech.

Wembury Voluntary Marine Conservation Area13
Mandy Wilkinson tells us about an educational project for schools children in southern England.

Implications of Use of On-site Wastewater Treatment Systems for Houses in Unsewered Areas14
Donal Daly talks about the possible problems of one-off housing.

Forests in the Sea - The Fascination of Mangroves.....15-17
Jenifer Baker explains why mangroves forests must be protected.

Impact of Habitat Degradation on Fish Stocks18
The Fisheries Boards have been helping to improve the quality of rivers in order to enhance fish stocks.

Environment in Focus 2002.....19
The EPA report on important indicators for the environment.

After Thoughts by an American Regulator.....20
David Killoy suggests that Ireland might learn from the planning mistakes of the US.

Spider!21
John Akeroyd takes a humorous look at the spider!

Publications of Interest22

Monks Take On A New Habit23
Declan Quigley on large-headed monk or angler fish.

Teesmough National Nature Reserve - Industry and Nature in Partnership.....24
A demonstration from Anthony Toole of how industry can enhance rather than confront their surrounds.

Captain Cockle and The Pond.....26
The third of an exciting four part story by John Joyce - Attack of the Swans!

Itsy Bitsy Spider.....27
Its a race to become to the King of Arachnids!

Spider, Spider Puzzle Page28

Fieldfare and Bird Care Recipes29
Enfo teach us to draw the fieldfare and gives us recipes for feeding birds this winter.

Irish Fish Stew or Chowder from BIM30

Environmental Competition for Primary School Children in Munster 2002

The President's Awards - A Challenge to Young People... 32
Are you interested in the challenge of a lifetime?

Editorial

Dioxin Emissions from the Burning of Household Waste

By Matt Murphy

THE recent report from the EPA *Inventary of Dioxin & Furan Emissions to Air, Land and Water in Ireland for 2000 and 2010*, brings into the public arena very important information, especially on the issue of incineration/thermal treatment.

- The main objectives of the report were to:
- Identify the principal sources of dioxin emissions
 - Quantify these emissions on the basis of reported information.
 - Consider the likely future impact on the inventory resulting from the establishment of thermal treatment and other industrial plants.

The report shows that the biggest source of emissions to both air and land is from uncontrolled combustion processes ie:

- i) Burning of domestic waste
- ii) Accidental house fires
- iii) Domestic heating and cooking
- iv) Halloween bonfires

The total estimated emissions of dioxins in 2000 were 93g of which 68g (70%) came from the above four sources.

In comparison the emissions from nine existing hazardous waste incinerators amounted to 0.0068g (0.015%) of the total to air in 2000.

The reports states that if by 2010 1 million tonnes of municipal waste and 100,000 tonnes of hazardous waste were to be thermal treated by 2010 the dioxin emissions to air would amount to 0.5g or 1.65% of the total projected emission to air. The incineration ash from such plants would be landfilled under controlled conditions at licensed facilities and be 18% of total dioxin emissions to land.

This EPA report for the first time gives us information of the levels of dioxins from various sources. The issue of dioxins has been emotive and controversial for many years. The mere mention that a thermal treatment/incineration plant could be located in an area has seen comments of the dire consequences to health. There is no doubt that this report shows that uncontrolled fires are the major culprits in dioxin emissions. Many amongst us have been guilty of burning our own domestic waste. It contributes 17.9g annually to air and land. It would seem that the opponents of incineration should be campaigning to reduce the uncontrolled combustion figures. Indeed properly run incinerators could drastically reduce dioxin emissions to our environment. It might surprise people to read from this report that the so popular Halloween fires contribute 0.9g to the annual national total - much more than the nine incinerators at present operating in the country.

In Ireland we could have three outlets for our waste - recycle, landfill and incineration. Recycling can take out a reasonable amount of waste if people are prepared to do it and markets can be found. Incineration can be licensed, with stringent controls. The landfill Directive requires successive reduction in the percent of organic wastes being landfilled. In short this means more organic materials will have to be composted/digested or otherwise recycled or thermally treated. With landfill there are also major questions down the road for the coming generations. How successful will the linings, to stop leachate, be long term? The costs of monitoring landfill sites will go on for 25-50 years after they are full to capacity and closed down. The cost of such monitoring, which is now included in

domestic waste charges, will rise hugely in coming years - the question is, will people want to continue to pay more and more? We already have negative reaction to the current increases.

The Irish people need guidance in this whole matter of waste. The agency for that is the EPA. They are the people that will have to issue licences for any waste operation. I believe that if they agreed to licence incineration plants then it should be accepted. Do we cherry pick their advice when it suits us? If that is the case then the well being of the environment is doomed. The EPA in its 10 years of existence has made huge inroads into the appalling attitudes to the damaging of the environment by all citizens. The EPA has much more to do however in order to gain people's trust. It must continue to rise to even greater heights to protect our now very fragile environment. Some of the EPA's major achievements have been the issuing of 500 (environmental) licences to industry and 100 licences for waste disposal by local authorities and others.

The Minister for the Environment and Local Government, Mr. Martin Cullen, having received the report, stated: "Controlled sources of dioxin emissions are required to deliver progressive improvements in emission performance. For example, the power generation sector will shortly be subject to more stringent emission controls under a new EU Directive on Large Combustion Plant. Similarly, vehicle emission controls will continue to improve. Clearly, uncontrolled combustion processes are our main concern, if we are to reduce further national dioxin emissions to air. In particular, the burning of waste households is an apparent problem which the public will have to face up to."

Table 1: Summary of Dioxin Emissions to Air, Land and Water in Ireland for 2000 (Main Categories)

	AIR		WATER		LAND	
	Best estimate g/annum	% Contribution to total air emissions	Best estimate g/annum	% Contribution to total water emissions	Best estimate g/annum	% Contribution to total land emissions
Waste Incineration	0.0068	0.02	0.0084	0.16	0.0034	0.01
Ferrous and Non-Ferrous Metal Production	2.0942	6.15	0.0000	0.00	1.6218	2.85
Power Generation and Heating	3.3203	9.76	0.0000	0.00	8.1066	14.22
Mineral Production	1.9969	5.87	0.0000	0.00	0.0000	0.00
Transport	0.9714	2.85	0.0000	0.00	0.0000	0.00
Uncontrolled Combustion Processes	25.6363	75.34	0.0000	0.00	42.1822	74.01
Production and Use of Chemical and Consumer Goods	0.0000	0.00	0.0000	0.00	0.9013	1.58
Miscellaneous	0.0015	0.00	0.0000	0.00	0.0047	0.01
Disposal/Landfill	0.0000	0.00	2.1762	99.84	4.1755*	7.33
TOTAL	34.0273	100.00	2.1796	100.00	56.9983	100.00

Source: EPA report - *Inventary of Dioxin & Furan Emissions to Air, Land and Water in Ireland for 2000 and 2010*

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Photos: © Oscar Merne

The Breaches, between Kilcoole and Newcastle station, Co. Wicklow.

By Oscar Merne

EVER since my early teens (over forty years ago) I've had a great fondness for the marshes which extend along the Wicklow coast from just south of Greystones to Wicklow town. In those early years I lived at Seapoint, beside Dublin Bay, and it was quite an easy cycle ride from there to Bray and Greystones, and on southwards along The Murrough which separates the marshes from the Irish Sea. It was a good place to watch birds, because of the variety of habitats along this 16km

stretch of coast, and interesting birds could be seen at all seasons of the year. For the last twenty-five years I have been living in Bray and during this time have frequently revisited this favourite place of my bird-watching youth. I regret to say that the fifteen-minute comfortable car drive has taken over from the more energetic cycle ride over Bray Head. On the other hand, the quick drive to Kilcoole and back leaves more time to walk down the coast and watch the birds in the marshes.

The North Wicklow Coastal Marshes start at Ballygannon, about

2km south of Greystones. The first stretch, extending south to Kilcoole railway station, is mainly reedbed and carr, with standing open water during winter floods. Between Kilcoole and Newcastle station lies the area known as The Breaches, which until about ten years ago was largely saltmarsh, partly inundated by high spring and storm tides entering the marshes by a narrow cutting in the shingle barrier. This cutting is the exit for a number of small streams which flow down into the marshes from the eastern slopes of the Wicklow Mountains, and is the only drainage outlet other than the mouth of the Vartry River at Broad Lough at the south end of the marshes. Now the north and south ends of the Kilcoole-Newcastle stretch have been separated by drains and dykes from the salt-marshes – for improved grazing at the north end and a small airfield at the south end. Continuing southwards from Newcastle there are access roads (from the R761 Greystones-Rathnew road) at Five Mile Point and Killoughter/Ballybla. Here the marshes vary in width between 0.5 and 1km and are a mixture of freshwater reedbeds and drained, “improved” lands, some of the latter being very attractive to a flock of wintering Greylag Geese. The most southerly section of the area is occupied by Broad Lough, which is the tidal estuary of the Vartry River. There are extensive reedbeds and areas of saltmarsh around the lough. The whole system is separated from the sea by a long, narrow shingle beach crested by low dunes, along which the Dublin-Ross-lare railway runs.

In high summer the area is most important for its long-standing breeding colony of Little Terns. These birds overwinter on the coasts of West Africa and return to Ireland to breed between April and August. Up to 50 pairs, about a quarter of the entire Irish breeding population, breed on the upper levels of the shingle beach – usually between Kilcoole and Newcastle. Because of the importance of this colony and its vulnerability to disturbance and predation, it is afforded full-time protection each summer by BirdWatch Ireland and Dúchas The Heritage Service.

Another important feature of the marshes during the summer is the high density of breeding Lapwings, a species which used to be common and widespread throughout Ireland, but which has declined dramatically due to drainage and agricultural intensification. Various other waterfowl species also breed in the area, e.g. Oystercatchers and Ringed Plovers on the beach, Redshanks, Mute Swans, Mallards, Teal, Shelducks in the marshes.

During the “winter” months of September to April inclusive the marshes are an important area for a variety of migratory waterfowl. The most important of these are the Pale-bellied Brent Geese from NE Arctic Canada which fly daily from their night roost in Dublin Bay to graze on the rich grasses at Kilcoole. Usually 500-700 occur, but sometimes over 1,200 have been counted. The site is classified as internationally important

Birds of the North Wicklow Coastal Marshes



Pale-bellied Brent Geese, from NE Arctic Canada, fly daily from their night roost in Dublin Bay to graze on the rich grasses at Kilcoole.



The Whooper Swan is an important wintering species on the marshes.

for this species as it regularly holds more than 1% of the entire European wintering population. Another important wintering species, found mainly at Kilcoole, is the Whooper Swan which comes here from its Icelandic breeding grounds. Usually between 40 and 50 are seen on the marshes. As mentioned above, Greylag Geese (also from Iceland) are regular visitors, especially to the fields north of Broad Lough. Between 200 and 300 are counted each winter. Other regular visitors to the marshes include Cormorants, Wigeon, Golden Plovers, Curlews, and several gull species. When SE gales lash the coast and huge waves crash on the beach large numbers of Little Gulls appear and feed on small creatures churned up in the breakers. When the gales abate the Little Gulls disappear as quickly as they appear, back to their offshore foraging areas.

Because of their importance for the various birds mentioned above, two areas have been designated as Special Protection Areas for birds, under the

European Union's Birds Directive, and there are proposals to extend the SPAs. In addition most of the North Wicklow Coastal Marshes have been proposed as a Natural Heritage Area and a Special Area for Conservation (EU Habitats Directive). BirdWatch Ireland also has a bird reserve area just south of Kilcoole station.

The North Wicklow Coastal Marshes are an ideal area for general birdwatching. They are easily accessible from the Greater Dublin conurbation, there is good car parking at Kilcoole railway station, and it's an easy and pleasant walk down along the coast for as short or as long a trip as time and energy allow. There are interesting birds to be seen at all seasons and many are tolerant of people walking along the path beside the railway line. It helps if you bring binoculars, and, of course, beware of trains!

Oscar Merne heads the Bird Research Section of National Parks & Wildlife, Dúchas The Heritage Service, 7 Ely Place, Dublin 2.

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Greening the urban landscape

From hospitals to eco-villages, there are trail-blazing projects out there which show that being green is no sacrifice. Judy Jones looks at some of them.

If you drive a lorry with a smoking exhaust onto the Great Western Hospital site in Swindon, you may be let off with a caution. If you haven't got it fixed by the time you return with another delivery, you won't get your load past the security barrier.

Sustainability has not only been welded into design and construction of this replacement for Swindon's ageing Princess Margaret Hospital. Environmental stewardship has also been the green thread running through workforce training and the supply chain.

Political controversy about the procurement of the hospital under the Private Finance Initiative has all but obliterated one of the Government's aims in commissioning the project - to produce a flagship for sustainable construction. When Carillion, the UK's largest construction company, won the contract to build the hospital, it invited the international sustainability charity The Natural Step (TNS), whose chairman is Jonathon

Porritt, to help it achieve that aim.

"Carillion took the bold decision to embrace sustainability not merely in terms of the fabric of the building, but in the thinking behind design, and the "metabolism" of the hospital throughout its life," says Dr. Mark Everard, seconded by the Environment Agency to become Director of Science for TNS.

A sustainability action plan was drawn up to inform the tendering process, and give suppliers incentives to innovate in conserving finite natural resources. The walling contract went to Lafarge of Avonmouth, which produced an energy saving one-ply board which needed far fewer brackets and fixings than traditional versions. Offcuts were backloaded onto delivery lorries for recycling back into the manufacturing process.

The thermal efficiency of the roof insulation was upgraded from the original specification, to do away with the need for radiators on the

top floor.

To date, some 200 tonnes of waste has been recycled, compared with 158 tonnes going to landfill. "The really clever thing is to put learning about sustainability into the supply chain," says Dr. Everard. "It wasn't just about using eco-efficient products, but doing things differently."

As the six storey hospital with 559 beds prepared to open its doors to patients in December, the building contractors admitted that the construction process had not always been a smooth ride. "It's been a learning experience for us and our partners," says Jas Dhani, Carillion's building economist. "The Natural Step gave us the tools to think about sustainable development, and find solutions that fit the environment as well as the hospital." Jas Shami points out that true sustainable construction is still the exception rather than the rule in the building industry, partly because of ill-founded fears that it means higher costs.

Environment Agency won a BRE award for environmental excellence for siting its Starcross Laboratory in a disused Defra building in Devon.

Grass-sprouting 'green roofs'

The momentum towards environmentally-sound construction is slowly helping to create new sustainable communities, and mitigate climate change. But in some parts of the country, it is also promoting biodiversity and a renaissance of threatened species. Take the Black Redstart, for example, an urban dwelling bird rarer than the Golden Eagle, that thrives on brownfield sites.

One of the aims of Deptford Creekside's £8.2 million urban renewable programme in south London is to encourage wildlife, as well as attract new employment opportunities and inward investment to the area. The new wooden-framed Creekside Education Centre and the Laban Dance Centre have each been fitted out with a special "green roof", a layer of crushed bricks and cement recycled from the derelict site.

These aggregates-based roofs, popular in Germany and Switzerland for 20 years or so, are good for wildlife - including invertebrates - because they sprout grasses and herbs after installation. Once established, they are also said to reduce the pressure on sewerage/drainage systems by absorbing rainwater.

Dusty Gedge, who runs the Redstart Action Plan for London, points out: "There are fewer than 15 pairs of black



Warming to sustainability: roof insulation at Swindon's Great Western Hospital did away with the need for radiators on the top floor.

In the future the impacts of developments will need to be reduced over their whole life-cycle. By looking further than "production" costs, you make sustainable construction and drainage more cost effective.

Goodbye energy-guzzlers

Many construction businesses are finding a ready market for energy efficient housing and associated developments. The familiar gated cluster of traditional energy-guzzling executive homes sitting cheek by jowl on a greenfield site, miles from shops and other services, may soon be on the way out.

When Gusto Homes sold the first houses on its pioneering Millennium Green development in the village of Collingham near Newark, new residents were delighted with their solar powered homes and their recycled rainwater systems for washing machines and flushing toilets. Such was their enthusiasm, they drew up a rota to run the show house and sell the environmental virtues of the development to prospective buyers. Officers from the Environment Agency's Midlands Region have been working with Gusto and Severn Trent Water evaluating the scheme's water savings.

Other developers have gone further by integrating the principles of social and economic sustainability into their environment-friendly designs for living and working.

The pioneering suburban eco-village BedZED aims to show that green living is real and affordable. It is a large 82-home development on a brownfield site (a former sewage works) in Beddington in Surrey, with office space and live-work studio apartments. The ZED stands for Zero Energy Development - it only uses energy from renewable sources generated on site.

BedZED is the first major "carbon neutral" community and aims to cut household water consumption by a third through devices such as rain-water storage facilities and highly visible water meters. A 'Living Machine' consumes waste water in a greenhouse filled with plants. A healthy living centre, café, nursery and sports facility are incorporated in the scheme, which was designed for the Peabody Trust.

As energy minister Brian Wilson observed during a visit to the Buildings Research Establishment (BRE), the demand for such buildings will grow. "The technologies are available to deliver practical systems. The challenge now is for the construction industry to mobilise the supply chain to



High flier's overhead: Deptford's wooden-framed education centre is fitted with a "green roof", good for wildlife such as Black Redstarts.

meet this demand."

The [UK] Government has made clear to the construction industry that it expects it to contribute to the target of producing ten per cent of UK electricity from renewable resources by 2010. In September 2002 the BRE published a sustainability checklist for developers, planning authorities and their advisers to use in all types of construction.

New buildings are of course only part of the equation. Conversions, restorations and refurbishments have an in-built advantage when opportunities for sustainability are being assessed: the buildings are already up. The

redstarts across London, and two of these pairs are at Deptford Creekside. Green roofs are good news for this threatened species, because they replicate aspects of the brownfield land that attracts the bird. There are several other environmental benefits, so it's important to get green roofs into many more urban regeneration schemes."

Judy Jones is a freelance writer who has worked for The Observer, The Guardian and The Independent on Sunday. The article was reproduced from "Environment Action" - www.environment-agency.gov.uk

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Sacrificial Beach Nourishment

By Michael Ludwig

BEACHES are constantly changing. Wind, waves, changes in sea level and even beach visitors cause those alterations. Beach changes, particularly erosion, were not a problem until coastline property had economic value. Beach ownership seems natural now, but a century ago, living near the water was deemed perilous and avoided. After World War II, shoreline property value rose quickly and erosion became a concern. Erosion control was used, even though it earned a dubious reputation. For much of its history, erosion control meant installing large structures designed to alter erosion patterns. Often, the structures do not work and they may even increase erosion. Walk on any beach with a groin structure and look at the difference in beach height from one side to the other. One side benefits at the other's expense. In the last two decades, most erosion control efforts have stopped using structures.

No two beaches are alike and all are constantly changing. They react to local as well as global events and conditions in seasonal, cyclic and permanent ways. Beaches look dif-

ferent in summer and winter because the waves striking them are different. Waves move sand offshore in winter and return some of it as the summer progresses. This is the offshore-onshore sand cycle. Rising sea level is altering shorelines, permanently. Is it any surprise that beach erosion control is a growth industry? For every situation, there are many different and, often, expensive ways to "save the beach." The list of solutions is longer than the coastline they were intended to save. The designs include

artificial seaweed, concrete blocks in every shape and configuration imaginable, beach dewatering systems, groins, jetties, revetments, offshore breakwaters of every possible material, buoy fields and beach nourishment. None have been able to stop erosion. No matter what humans do to change the outcome of the confrontation, continued erosion, expenditures and frustration are the only certainties.

The importance of a beach, to humans is usually defined by use

levels and revenue generation. In eroding coastal areas with low populations, the relationships of benefits derived from beach protection, often, do not exceed the cost of undertaking it. If a community has the money to attempt a solution at such a beach, it may be undertaken, generally, without regional or national funding. Most of those efforts are insufficient

"Beach nourishment is only part of the term applied to the practice of putting sand on eroded beaches to recreate or expand the dry and intertidal portions."

and fail. At the other extreme are beaches like Miami Beach, Florida, Coney Island, New York or Ocean City, Maryland. In these cases, tourism revenue

and capital investment justify major and long term, government involvement.

After years of trial and error, beach erosion control has come to rely on beach nourishment. Beach nourishment is only part of the term applied to the practice of putting sand on eroded beaches to recreate or expand the dry and intertidal portions. The whole technical term is sacrificial beach nourishment. Why is sand placed on an eroding beach, sacrificial? The answer is that sacri-

ficial beach nourishment treats the visible result of erosion not the underlying causes. The placed sand is expected to erode, "sacrificed" to the forces of nature. Projects are planned with periodic sand replacements included. Once started, the practice must be continued or one faces the wrath of the affected. Coney Island Beach in New York City receives more than 20 million visitors per summer. The sitting area is maintained by additions of sacrificial sand. In a persistent storm, the sand will disappear in about 17 hours. The sandy beach along the Million Dollar Mile of Hotels in Miami is a major part of the area's attraction. It could erode away in less than a day. In both locations, storm induced losses of sand occur infrequently and the beaches are replenished on a routine basis.

In Ocean City, Maryland, a large concentration of tourism, investment and local pride exist. Unfortunately, their erosion is a daily, not a storm, event and occurring faster and somewhat differently than at Miami or Coney Island. Beach erosion is considered, often, to be a shallow water problem. That is not true. Beach stability is dependent on the slope or angle of the seafloor out to water

depths over 70 feet and, perhaps, two or three miles offshore. When the seafloor slope is altered, erosion accelerates as the system reestablishes a "stable" profile. Ocean City has an unstable seafloor profile and cannot correct it. Adding sand to the beach actually increases the rate of erosion by making the slope angle more severe. The problem can be copied in small scale, by watching sand castles disappear. Waves striking the castle walls instantly convert them into gentle slopes that lead away from the collapse. It takes only a few waves to reestablish the natural beach slope. A good beach nourishment project offers the added sand to Mother Nature in the hope that she will take it away, slowly. Ocean City does not have a good beach. Erosion has doomed it to ever escalating erosion control expenses and a certain death.

Beach stabilisation is a concept our forefathers laughed at. It is a lesson in losing that we learn as children. None of those experiences seem to give us the ability to accept a natural certainty. Enjoy the beach today. It will not be the same tomorrow.

Michael Ludwig, NOAA, NMFS, Milford, CT USA 06460-6499, USA.

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By Chris Barron

RHODODENDRON is known to many as the beautiful garden plant which brings a vivid display of colour to many gardens every year. However, there may be more to your favourite plant than you realise!

There are over 600 species of Rhododendron in the world. One of these, *Rhododendron ponticum* has its main and most continuous natural distribution in the region of the Black Sea, but it is also native

is ten to twelve years old. Each flower head produces 3,000 to 7,000 seeds, and a small bush may produce over one million seeds each year! Having flowered in early summer, the seeds are ripe by December, and are dispersed between then and March. The seeds are some of the smallest to be found in the plant kingdom, and are scattered by wind, water and animals. They can travel over a distance of between 100m and a kilometre.

Once established, Rhododendron can grow under heavy shade. It often forms dense

land plants and insects for their survival.

The leaves of Rhododendron contain andromedo toxin, which is highly poisonous if eaten by mammals. For this reason the plants are generally avoided by grazing animals, giving them a significant advantage over other plants in woodland or on bog. It also re-grows vigorously when cut, making it difficult to remove from an area once it has become established.

Its poisonous nature, vigorous reproductive strategy, and affinity for acidic soils makes

In order to rid a habitat of Rhododendron a number of steps have to be followed.

Rhododendron is cut down using bow-saws or chainsaws.

All stumps are destroyed, either by digging out of the ground, or by treating with herbicide.

Cleared woodlands need to be visited again to remove any seedlings that have germinated after initial clearance work has been completed. This is vital, as new seed often enters a cleared area from adjacent Rhododendron plants which



With each flower head producing 3,000 to 7,000 seeds, a small bush may produce over one million seeds each year!

Photos: © Killarney National Park Education Centre

RHODODENDRON

The major conservation concern for Killarney National Park

of parts of Portugal and Southern Spain. It is also widely introduced in many European countries including Ireland and is a popular garden shrub.

Rhododendron ponticum is evergreen, with dark green, waxy, oblong leaves, producing conspicuous pinkish purple flowers in May and June. Individual shrubs can grow to reach a height of two to twelve metres. Rhododendron is highly adapted to wet acidic soil conditions. It does not usually produce flowers until it

thickets that allow only about 2% of total daylight to reach the woodland floor beneath it. This exclusion of light prevents tree regeneration, and growth of other plant species, thus lowering the plant diversity in any community where it becomes established. Very few insect species are associated with Rhododendron, due to its toxic nectar and poisonous leaves. This in turn means that little food is available for the birds and mammals that depend on these native wood-

Rhododendron ponticum a highly effective invader of natural habitats on acidic soils.

Rhododendron is one of the biggest conservation problems facing Irish woodlands today and the eradication of it from an infested habitat is a huge challenge. Efforts to control Rhododendron in Killarney and Glenveagh National Parks have been in progress for well over twenty-five years and the future of large areas of bog and native woodland are under threat from this invasive plant.

have not yet been cleared.

Groundwork, a voluntary organisation which is affiliated to the Irish Wildlife Trust has been clearing Rhododendron from the woodlands of Killarney and Glenveagh National Parks since the early 1980's. At the beginning of September, the volunteers completed their 2002 work programme in Killarney, which again concentrated on some of the more inaccessible woodlands on the western side of the Park.

During the last 22 years Groundwork volunteers have cleared (and most importantly are keeping clear) Rhododendron from approximately 360ha of the ancient oak woodlands of Killarney. The work often involves tackling some of the most heavily infested woodlands of the Park.

The volunteers who come to the Park to help with the clear-

ance are of all ages and nationalities. The lower age limit is 17 but the upper limit is 65 and anyone is welcome as long as they are reasonably fit! The volunteer workforce this year was made up of people from 16 different countries, including New Zealand, Australia, Greece, The Czech Republic, Poland and the USA, with a total of 223 volunteer weeks being worked. The majority of the volunteers would normally be students but a large number of people with other professions also come along.

The work is supported by Dúchas, who provide the volunteers with hostel accommodation and plenty of food while they are on the workcamp. Dúchas also provide the transport necessary to get the volunteers to the worksite, which takes the form of Landrover and boat.

"Its poisonous nature, vigorous reproductive strategy, and affinity for acidic soils makes Rhododendron ponticum a highly effective invader of natural habitats on acidic soils."

Even then, there is usually a hike which could be anything up to a 30 or 40 minute walk up the mountainside to the area to be worked in.

Groundwork relies on large numbers of Irish volunteers coming onto the workcamps for various reasons, but the most important one is, so that suitable volunteers can be trained up to act as voluntary leaders and assist in leading workcamps in future years. Unfortunately the numbers of Irish volunteers recently have been dropping and it is only through the generosity of people

giving up a week or two of their summer holidays that this vital work will be able to be continued.

Anyone who would like to find out more information about the impact of Rhododendron or would like to join the volunteers in the woodlands of Killarney or Glenveagh National Park should contact GROUNDWORK at 107 Lower Baggot Street, Dublin 2. Tel. 01 676 8588 or visit www.groundwork.ie

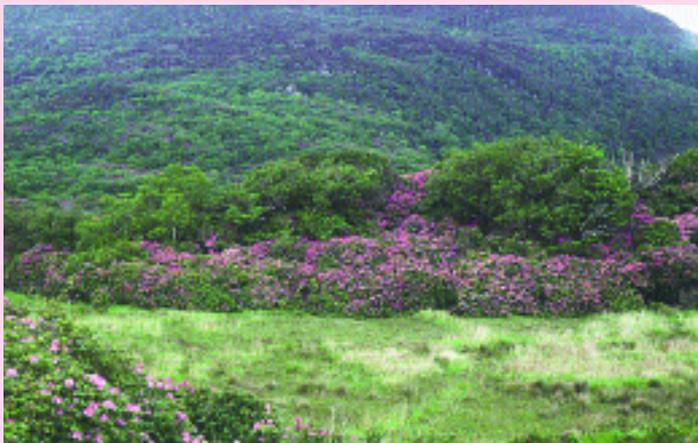
Chris Barron, Killarney National Park Education Centre, Knockree, Killarney, Co. Kerry.

Clockwise from top left: An example of the level of infestation on the slopes of Sheehy mountain Killarney National Park.

Volunteers travelling to the worksite by boat. *Groundwork*, a voluntary organisation which is affiliated to the Irish Wildlife Trust has been clearing Rhododendron from the woodlands of Killarney and Glenveagh National Parks since the early 1980's.

All stumps are destroyed: here volunteers are burning rhododendron.

Volunteers working to clear Rhododendron from O'Sullivan's Cascade.



Time to change - The Future of Fisheries Management

By Jason Wooley

ANYBODY who knows anything about fishing knows that the Common Fisheries Policy hasn't worked, in particular its conservation policy has been a disaster. The conservation policy has failed primarily because blunt instruments like quota cuts were identified as solutions to complex stock issues. Bureaucratic initiatives diluted by politicians have compounded problems. Politicians from 15 member states could never agree on these crucial issues, imagine what will happen with 25 states. Identifying what has gone wrong with the industry isn't rocket science, identifying the solution is where we need to be clever. How can we move forward? Without question we can't continue as we have done. I'm convinced that we need to break down our current system into regional bodies. These groups will be able to tailor management decisions to regional needs. Critical to this devolved system will be increased stakeholder involvement, something that is absent at the moment.

My support for regional bodies comes from my exposure to the South and West Pelagic Advisory Committee. I believe that in this group we have the role model for future fisheries management in Europe.

The South West Pelagic Advisory Committee

The Celtic Sea herring fish-

ery is extremely important to the economy in areas along the south and south-west coasts particularly during the October to March period. In 2001 the Total Allowable Catch (TAC) was 20,000 tonnes of which Ireland's share was 17,290 tonnes or 86%. As a result of very poor acoustic surveys the initial scientific advice for 2002 was that the quota should be reduced to 4,000 tonnes.

The industry disagreed with the advice and established the South and West Pelagic Advisory Committee. The Committee consists of fishermen, salesmen and processors, observers from the Department and the Marine Institute also attend meetings and serve in an advisory capacity. The Committee operate an open door policy, anyone who wishes to attend and become more informed may do so.

One of the main aims of the Committee is to improve the assessment of the stock by ensuring that the data required to carry out assessments is adequate, including biological sampling and surveys. The Committee has also adopted a management policy that aims to "manage the stock according to the best available scientific advice and to maintain the stock at a level whereby it can sustain annual catches of around 20,000t. The Committee will also introduce such measures as are necessary to prevent landings of small and juvenile herring including closed areas, and or appropriate time closures".

A critical feature of the work-

ings of the group was the co-operation between the industry and the scientists, in particular Mr. John Molloy of the Marine Institute. The committee began by identifying gaps in the scientific advice and then set about filling those gaps. A scientific work programme was organised aimed at obtaining additional scientific information. This programme included an experimental commercial fishery, a scientific survey to locate and map adult fish, an acoustic survey on a Commercial vessel and the involvement of processors in biological data collection.

During the season the Committee introduced a number of important conservation measures as a result of the enhanced scientific programmes. These measures were aimed at reducing catches of small first time spawning herring. It was decided that all efforts should be made to eliminate catchers of herring that contained more than 50% of individual fish below 23 cm. This threshold size level was selected as it corresponded with the onset of sexual maturity for this stock. Throughout the season a large amount of fish were measured by processors, fishery officers and scientists from the Marine Institute. This data was routinely submitted to the weekly meetings of the management committee and was used as a basis for management decisions. Eventually all fishing was prohibited from the area east of Mine Hd. (Co. Waterford) from mid January 2002. This, in fact, prohibited fishing on some of the most important

spawning grounds in the Celtic Sea during the main spawning period.

Finally the entire fishery was closed in early February before the seasonal quota had been reached. This was because of continuing concerns about the high proportion of small herring in the catches. Following this closure a pair of vessels took part in a trial fishery for one night each week to examine if the size distribution had increased. As there was no evidence of this the Committee decided to retain the closure for the remainder of the season. The net result was reducing the total catch for the season to the lowest recorded since the early 1980's. This proves that the industry led initiatives were not superficial but were driven by the desire to enhance the state of the Celtic Sea herring stock.

The Committee is at present drawing up a further scientific programme for future seasons.

This will build on information gathered during the past 12 months.

In my view this initiative demonstrates how fisheries

established the same committee for whitefish species. It means that productive real time management decisions can be made knowing that the



Photos © ISWFPO

management should work. The industry as a whole is working with the scientific community towards a common goal. Management decisions are more informed, it doesn't mean it's palatable to everyone but the scientific logic is clearly evident. The involvement of stakeholders is the most impressive feature of the committee, we have now

majority of the industry supports the initiative.

This management model is far from perfect, in time its operation can be refined but for now it's light years ahead of our current pan - European model.

Jason Wooley, Manager,
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By Enda Gallagher

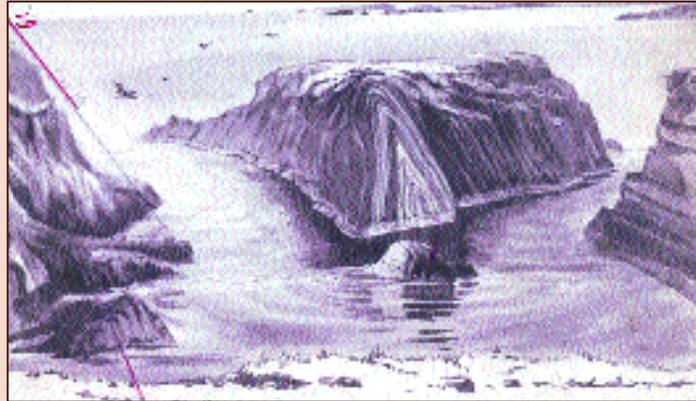
Geological Mapping: Ireland's 19th Century Field Geologists

MAPS are a form of illustration and illustrations often communicate a message more effectively than words. Geology is quite a difficult science for non-enthusiasts to acquaint themselves with. It follows then that geology lends itself particularly well to the use of maps to illustrate complex geological concepts. But where did geological maps come from originally? What kinds of people researched them and how did they do it? This article will attempt to answer these questions by discussing the history of Irish geological mapping with a particular emphasis on the people that carried out the mapping.

Why? - The historical context

As far back as 1786 saw one of the first public calls for a geological map of Ireland, the rationale being that it would assist in identifying mineral resources. The first geological maps produced in Ireland, and indeed predating a map produced by William Smith for England and Wales, generally considered to have been the ground-breaker for geological maps, date back to around 1800. The main problem with geological mapping around this time was the lack of a base map (ordnance survey map) on which to record observations. A base map would allow the field geologist to note and align the position of rock outcrops to the detail already incorporated into it. In 1824 this problem was addressed with the establishment of the Ordnance Survey of Ireland (OSI). By 1846 the whole country had been mapped on a six-inch to one-mile scale (six inches on the map to one mile on the ground - 1:10,650).

In map terms the six-inch to one-mile scale is lavish, and, when in 1845 the Geological Survey of Ireland (GSI) was formed, geological mapping at this scale was venturing into the unknown in world terms. It turned out to be perfect for the task since the breadth of topographical detail meant that rock outcrops were virtually unmissable. Also the sheets themselves were big enough to record vast amounts of geological details. GSI's brief was to map the entire country and the process that started that year in Co. Wexford was finished 42 years later



Toe Head, Co Cork.

in Co. Donegal. In the meantime it had been decided that publishing six-inch geological sheets for the whole country was too mammoth a task to complete. So from the 1850's onwards whilst the fieldwork was done on the six-inch sheets the work was actually published at the newer OS one inch scale. The resulting one-inch series (1:63,360) numbered 205 sheets (together with accompanying descriptive memoirs) providing full coverage of the whole island. By 1890 the one-inch geological map of Ireland was finally complete and public.

How was the mapping done?

During the 42 years of this field-mapping programme the field geologist (always male) was despatched to an area with two copies of the six-

inch and two of the one-inch (OS sheets). One of the six-inch sheets was a working sheet onto which all exposures of rock had to be marked in pencil during the day's fieldwork. In the evening his job included the tracing of all notes and illustration in Indian ink on a fair copy. Also he had to find time during evenings or wet days to duplicate his work on the second sheet. He then had to transfer his work to each of the two one-inch sheets that provided him with a broader context. When a one-inch sheet was complete it had to be sent off to HQ in London for approval. Then followed a series of returns until all required details were included and all parties were happy, before it went to the colourists in England for publication. All of the water-colouring of the maps (individually hand-painted) was done in England to maintain consistency of every sheet.



Sketches © Geological Survey of Ireland

Fastnet Rock, Co Cork.

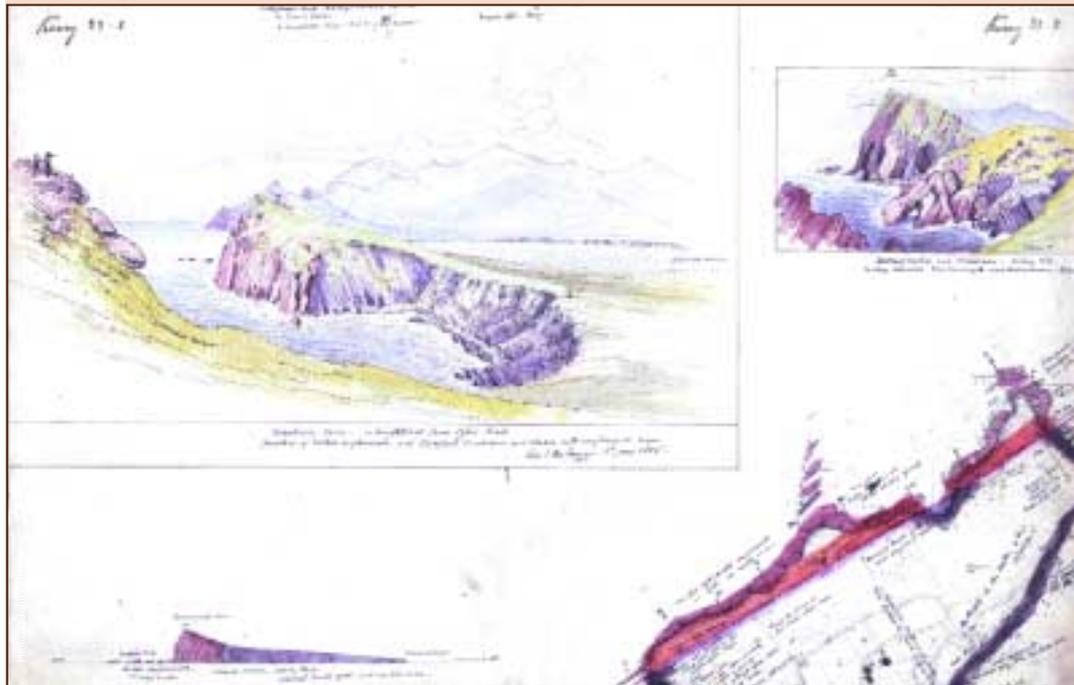
What were the conditions like?

It is important for us to consider the type of lifestyle these 19th century field geologists must have had. Surely it must have been a lonely existence to be away from home for long periods of time? Indeed where was home? What must the wives and families have thought of their work and did they have to follow to the area of fieldwork?

We can't paint a vivid picture of their lives without some degree of guesswork. Yet there are some interesting insights in records of the day. We can discern for instance that the men were educated and often from Britain. It seems certain that some of them felt that the people amongst whom they had to move and live were peasants and far beneath them. One of the first written descriptions of life as a GSI field geologist comes in 1845 from a gent named Smyth. In a letter to a superior he wrote about two of his colleagues - a "Welsh Squire" who was "in misery in Ireland" and "the captain who sports a ferocious pair of egg-brown moustaches."

From the records we know that for the most part the men travelled on foot during the course of their day and rented lodgings nearby by night. In 1847 Wicklow was the main area of interest but parts of the county proved to be quite remote. One of the officers involved in the survey there was Willson who, it seems, was unable to find lodgings for the area around Kings River and Table Mountain. Thus, he sought and was granted permission to hire a horse and cart by day to get him to these areas in a timely fashion. However, a later record from 1856 indicates a low budget for such incrementals "and always the staff were wasting long hours tramping between their lodgings and their ground because there was never available sufficient money to allow for the regular hire of cars and horses."

The records also reveal some interesting implications of the weather, the seasons and other natural conditions on the mapping programme. In 1847 we find mention of the famine which was obviously creating problems when in March officers were given a day's leave in recognition of the great tragedy unfolding. Bad weather in 1852 rendered impossible surveying for two full months. In 1854 there are reports of officers meeting delays with "extensive spreads of peat and impenetrable thickets of furze." In



Near Smerwick Harbour, Co Kerry.

1856 another bad summer was recorded having particularly adverse effects on mapping. In 1887 the final county to be mapped, Donegal, was completed. The last bit was around Ramelton and it was delayed until after the harvest because it was easier to access parts of the area then.

Who were the Field Geologists?

Many of the field geologists were studious in all aspects of natural history and produced engaging and important books, articles and studies of all kinds of topics including archaeology, bats, fish, botany, meteorology and zoology. Many of them were also accomplished artists. Many of these original sheets are decorated with all kinds of illustrations, some relevant i.e. a sketch of the landscape, some totally irrelevant e.g. a fair day scene or a dog chasing a hare! Often times they would artistically record their drawings and illustrations on woodblocks. With woodblocks illustrations were drawn in reverse – imagine how difficult that must have been! – so that it would transport to the paper in its proper manner. Once drawn they would be “engraved” sometimes by the artist, then ink is rolled over the woodblock surface and finally pressure is applied to the block onto paper leaving an image. Woodblocks were the main means of printing illustrations for the memoirs written by the men as a description of the maps being produced. Woodblocks would later be superseded by photography.

Alongside these many diverse gifts often the field geologists managed to find time to indulge other passions such as fishing and shooting. Indeed on occasion, complaints were relayed to superiors by gamekeepers about members of the mapping team. One of the mappers, a man named Wilkinson, in his autobiography tells us that his most noteworthy day’s shooting resulted in 125 successful shots at game and



Sketches: © Geological Survey of Ireland

A view of the Blasket Islands, Co Kerry.

fowl in the bogs of Co. Mayo! A further successful day for him, this time with a rod instead of a gun, resulted in him landing 102 salmon and grilse in and around Lough Melvin in Leitrim and Fermanagh!

Conclusion

Perhaps the most amazing thing about these men is that the maps they produced in the second half of the nineteenth century are still in

almost constant use today in the offices of the GSI. Their value is undiminished with the passing of years, decades, indeed centuries, particularly now with the arrival of advanced scanning and digital technologies to extend their life-cycle even further. Unlike us, mere humans, the maps have a virtually infinite life-cycle, yet it was precisely the excellence of the original human effort which has made them so valuable, back then, today and far into the future. Hoorah for the original field geologists!

Enda Gallagher, Geological Survey of Ireland, Beggar's Bush, Haddington Road, Dublin 4. Research and Quotes from "North from the Hook" G. Herries Davies, GSI, 1995, and "Illustrating Irish Geology" Exhibition 2000, Matthew Parkes, Petra Coffey, Elaine Roche, Cartography Section GSI.

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The energy starts here

Flowers of Ireland

By Daphne Pochin Mould

Fuchsia

A pretty South American arriving in Ireland, settling in and becoming a symbol of Irishness: this is the fuchsia's story. Around AD 1700, the French king's botanist, a priest, Father Plumier, made several voyages to America in search of plants. After long, slow travel in sailing ships, the precious roots and seeds were brought back. The fuchsia was named after Leonard Fuchs, whose "History of Plants" had been published in 1542.

The great botanic gardens of Paris and Kew in London maintained friendly relations even when Britain and France were at war. Kew got its first fuchsias in 1788.

Among the Irish gardeners who began to grow them was Peter Fitzgerald, the knight of Kerry (1808-1880). He had moved to Glanleam on Valentia Island and was developing what was to become the famous, sub-tropical garden there. The fuchsia he found, and wrote to the London "Times" about it, was an excellent shelter belt shrub behind which more delicate plants could flourish. He had one fuchsia, planted in 1854, and just let it alone and it grew so



"Fraochan" is the Irish name for these berries that appear amongst the heather (fraochlach), but for most of us they are blueberries.

big that each year the Fitzgeralds would assemble around it and measure its new circumference. In fact, fuchsias were growing like that all over south-west Ireland, thick hedges dripping their petals to carpet roadsides in red. Irish people called them "the tears of God".

Fuchsias these days come in a great variety of form and colours and hardiness, and there are Fuchsia Societies of their devotees. All a very long way from a French priest nursing his plants on a long, rough voyage on a sailing ship back to France.

Coltsfoot

"Is 'mo galan ar ar maich an sponne" is the Irish of it, coltsfoot is good for many ills. Coltsfoot is one of the many bright golden flowers of early spring, sending up its little stems topped each with a golden flower head, long before the large leaves, more or less horse hoof shaped, appear. A plant of waste ground, widely distributed through Europe, a "weed" but with an enormous reputation in the past.

Its Latin name is *Tussilago farfara*, tussis, a cough, and a cough cure. In fact, Latin dictionaries will give it under several names, *tussilago*, *farfarus*, and lastly *chamaeleuce* which is simply its Greek name written in Roman letters. The Irish name, sponne, comes from its use as tinder: the cottony plumes of the seeds, the down on the underside of the dried leaves, would catch light from a spark from your flint and steel in your tinder box, to ignite fire or candle. The Greeks apparently used to smoke it as a cure for asthma, and indeed its use continued, smoking the leaves for that and other chest complaints.

Linnaeus called the Butterbur, *Tussilago petasites*, but other botanists put it in a separate family, *Petasites vulgaris*. It is sometimes called Italian coltsfoot. Like coltsfoot it has somewhat hoof shaped leaves, but a lot larger, and the flowers are a dull purple, borne in big clusters on a single stalk. Like coltsfoot, it grows on ditches, waste places, but appears later in the year. Also known as

plague flower - supposed to be a cure for a plague.

Foxglove

Foxglove, Our Lady's glove (French, gants de Notre Dame), goblins' gloves (Wales), Fairies' thimbles, Fairy Fingers, Folksglove, and right out of sequence, bobs. It got the Latin version, *Digitalis* (digit, finger, digitalis, thimble), in 1542 in Fuchs' (for whom the fuchsia would later be named) "History of Plants". The tall plant with its spire of bells, purple outside, delicately spotted within, is one of the our most splendid wild flowers and the Irish name Lus mor is perhaps the best of the lityan names.

At the start of summer, June, they begin to flower, the bells opening series, the lowest first, and bumble bees busy in them, and carrying the fertilising pollen on their hairy coats from flower to flower. They stand, tall sentinels along roadside or wood or by ditches and streams. Each bell produces a multitude of tiny seeds, and these are scattered widely as the wind sways the tall stems. Most foxgloves live two years, flowering the second, but the seed can lie dormant it would appear for decades. For come a clear, felled bit of forest or other land, and suddenly it seems, the whole is ablaze with purple, close packed spires, a slight to wonder at.

Digitalis purpurea is normally purple but a few white ones occur in the wild, and there are garden varieties of other colours. The plant was found



Each bell of the foxglove produces a multitude of tiny seeds, and these are scattered widely as the wind sways the tall stems.



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THE RACE TO THE DESTRUCTION OF THE MARINE FISHERIES

The Argentine Case

Prof. Enrique Balech

LIKE other natural resources, marine fisheries have become the prey of powerful international companies. They have only one target and ideal in mind and that is their own financial prosperity. The internationalisation of laws provides them with better chances for the possession of the golden calf. The nations that are the natural owners of any resource now have little chance of defending it.

A long time ago European nations lost most of their fisheries through overfishing, so now they try to recuperate this food source in other places. However this is not achieved by normal commercial procedures but instead in a more profitable manner: sending their ships to where the fish are. These pillaging ships go from place to place annihilating fishing grounds and leaving behind bankrupt local industries.

European countries including the then USSR initiated this practice of fishing far from home. Later on the Asian tycoons enlarged the group.

In 1997, according to the FAO (Food & Agriculture Organisation), there were 17 main world fishing grounds; half of them had already been destroyed and four of the remaining ones were in great danger. The FAO warned that fishing fleets had to be reduced; "simply there is not fish for so many ships." The reaction was the opposite to what was expected. The last most significant disaster, so well described by Matt Murphy (Fishing Update, 1995), occurred in the Canadian Atlantic fishing grounds. It was then evident that the next victim would be the SW Atlantic.

The South West Atlantic Fisheries

The Regional Zone

South of 35° S there is only one country bordering the west Atlantic: Argentina. It is elongated north-south and, together with Chile, it is one of the southernmost countries of the world. It has some 4,500 km of coastline. This configuration permits Argentina to have warm waters in the north and cold sub-Antarctic waters in the south.

While Argentina narrows to the south, its submarine shelf widens attaining a maximum width of nearly 900 km at latitude 51-52°. That is around four times the width of the corresponding land.

This geography should have pushed Argentina to exploit its marine resources, but that did not happen. Instead it developed into a country of agricultural and stock farmers, producers of grain, cattle and wood, together with some other products such as fruits and wine. Fishing became a minor industry, with a few people involved.

During the first half of the 20th century the yearly catches were some 40 to 70 thousand tonnes, almost all caught along the coasts of the province of Buenos Aires, extending from 35oS to 41oS. The rest of maritime Argentina constitutes what is generally named Patagonia, roughly extending to 55°S i.e. at the gates of the Antarctic realm.

The hake excels among the fish resources. It is abundant, of good quality and in demand. In some way the fishing for hake is a good sample of the forced evolution of the Argentine fisheries.

The distribution of our hake is clearly associated with the sub-Antarctic waters of the Malvinas current. Its area extends from 54° 34'S, some times reaching a little lower latitude. Therefore it is totally distributed on our continental shelf. Nonetheless it is also caught in the jurisdictional waters of the neighbouring republic of Uruguay. Thus a rather large CZ (Common Zone - a zone where the fishing rights are shared by two nations) was agreed.

In the 1970s the catches amounted to between 100,000 and 200,000 tonnes. Soon big Spanish factories vessels arrived and the catches rose to 460,000 tonnes - exceeding the MAC (Maximum Allowable Catch). In spite of these alarming figures, in 1991 they reached 520,000 tonnes, largely exceeding the allowable amount. These figures refer to EC (Effective Catches - the capture and bringing to port: it does not take into account the discarded catch). Thus to this enormous amount should be added the discarded losses which are mainly small fish sizes. One of the reasons for the often large proportion of discards is the use of "socks" (nets of smaller mesh that the fishers introduce into the legal net). Foreign vessels frequently use the sock.

The second biggest source of discards is due to the partial overlapping of the distribution of young hake and the dense populations of red shrimp - a crustacean of excellent quality and, consequently of high demand and price. The fishermen who catch shrimp want to have their holds totally free of fish. Therefore any fish, including hake, is waste so these dead fish are now thrown back into the sea. The proportion of shrimp to fish is generally around 1:26. Thus one tonne of shrimp caught produces the destruction of 26 tonnes of fish. Since most of the hake caught are juveniles, the real loss to the fish population is much higher.

To avoid this, the INIDEP (National Institute for Fisheries Research and Development) invented a net that separates most of the fish from the shrimp. It is seldom used because fishermen object that it reduces their catches a little. These enormous fish mortalities are more preferable to them than an insignificant reduction to their own profits. This net should be mandatory and they should be forced to use it.

Meanwhile the Patagonian boom had already begun, and the newspaper readers began to learn of the existence of previously unknown fish such as the long tail hake, the Patagonian grenadier, the southern codfish, etc.

These exotic and almost untouched fish aroused the greed of foreign fishermen. Russian and Polish vessels initiated the intensive catching of the Patagonian grenadier and long tail hake. Very soon the Asiatic fleet also appeared.

In 1982 two events occurred that were of paramount importance for these fisheries: the final approval of the so-called Law of the Sea, and the war of the Malvinas (Falklands).

The Law had positive and negative aspects for us. Positive, because some order and rules replaced a chaotic situation. Negative, because the country has an exceptionally wide continental shelf. Several important species are transzonal (i.e., accomplishing important migrations from rather shallow waters to the slope), or their area is almost as wide as the shelf. An artificial, political limit leaves them without the partial shelter of the EEZ (Exclu-

sive Economic Zone), with closed areas and seasons (generally in areas of spawning and juveniles). In spite of the fact that these important stocks are part of the integral Argentine fisheries, we may not protect them.

To avoid this, in 1995 the UN (United Nations) issued special rules for protection of transzonal organisms. Seemingly they have not yet reached these high southern latitudes because no changes have been noticed.

Although the Malvinas war was short, the political changes which followed it are more far-reaching and ominous.

As soon as the war ended the British administration of the Islands established a large EEZ and, at the same time others of 200 miles around two litigial Antarctic Archipelagos of S. Georgias and the Sandwich Islands, in spite of the fact that the Antarctic Treaty postponed sine die any national claim in the Antarctic realm (!!)

The EEZ of Malvinas (Falkland Islands) partly overlaps the Argentinean. Thus the Malvinas administration propounded (1990) a neutral zone around the Islands of a width of 50 miles, called FOCZ (Falkland Outer Conservation Zone). However by its own decision it was annexed to the Islands (1993).

Immediately after establishing its EEZ the Islands abundantly sold fishing licenses, and consequently the regional fisheries' licenses suffered an uncontrolled exploitation. In 1989 425,000 tonnes of fish were caught by these licenses.

Argentina reacted to this unfair competition and sold cheaper licenses to fish in its own EEZ - a much larger areas. Thus several countries moved their vessels (Japan, Taiwan, and others) to the Argentina zone, and Korean and Spanish fleets kept their Malvinas' licenses.

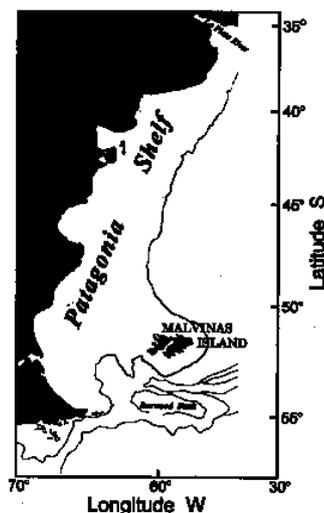
Of course the main victims of this competition were the regional fisheries. One of the unfortunate consequences was the almost total annihilation of the southern hake.

The most abundant fish is the longtail hake or grenadier; in five years its capture rose from 5,000 to 20,000 tonnes. A prohibition had to be established for the southern blue whiting for the ridiculous period of five months.

Even much more abundant is the Argentine squid, a mollusc of a quite peculiar biology. It is very fast growing and it has a short life, lasting only a year. Therefore in one year the whole stock is replaced. It usually spawns in dense groups on the continental slope. Its peculiar biology creates catching opportunities and, at the same time puts it at high risk. It makes it impossible to predict the population of the next year, and if the main captures consist of pre spawning animals, the risks of annihilation are high. Twice, strong evidences of stocks being fished to destruction obliged us to prohibit any squid fishing. As in the case of some other prohibitions the difficulties arise from the fact that only the boats operating in our EEZ obey it. In other words, the coastal state does the worrying while others make the profits.

Anyway the tonnage of squid captures rose to the almost incredible figure of 612 000 tonnes per year. The SW Atlantic alone supplies a quarter of the total world tonnage of squid. Japan was the first exporter of squid before overfishing destroyed the Pacific squid. Now it depends on our species.

Beyond our EEZ a big fishing fleet operates.



At night if you travelled easterly from an Argentinean port, you would be surprised as you approach the 200-mile mark by the lights that seem to illuminate the sky like those of a modern town. The foreign fleets operating along the 201-mile mark, bordering our EEZ form this well illuminated area. In fact many of these vessels frequently invade the EEZ. In a short survey a naval plane detected 161 intruders. Few of them are seized. A fair estimation of the ratio of captures to intruders would be no more than 1:200.

There are various reasons to explain this low performance. It is almost impossible for Argentina to constantly survey this long coast. The invaders are many and are backed by major financial investors and countries. This produces political and international complications. When the intruder catches sight of the patrol it rushes to the mile 201, usually with the help of other ships. For all these fishermen the common enemy is the local law. The illegal fishermen use many tricks to keep their business going. One is the use of twin ships. They are vessels of the same size, shape, name and colour of an authorised vessel.

The Argentine rules for foreign investments are probably the freest in the world. The astronomical external debts and the goodwill of corrupt authorities impose this generosity.

It is interesting to compare Argentine laws and those of other countries. Then amazing oddities are seen.

Argentine Rules

With agreement from the EU, several old vessels of the EU have been incorporated into our fleet. However they are allowed to operate under their own flags and crews "in a temporary association with a domestic company". Sixty eight foreign vessels are authorised to fish in our EEZ. They are from Japan, Korea and Taiwan. They take the biggest share of our squid. These countries forbid the buying of squid exported from Argentina. It has to be caught by their own vessels or by Argentine ships associated with a company of their own nation.

Man versus Wildlife

There is a clear case of competition between Man and the fish. The odds are against the fish.

I have already put forward the many unwise acts relating to fisheries. Any significant decrease of fish, crustaceans and molluscs unavoidably carries risk to the survival of other animals. The risks are enhanced by the sought-after fish.

In our region we have had huge losses in fauna because of oil spills, toxic red tides, etc.. but the most significant are those produced by man. Seemingly the South Georgias, in the North Antarctic region, saw the biggest butchery of marine mammals. In these islands some 1,200,000 sea lions and some 200,000 blue whale, the biggest animal ever to exist, were slaughtered.

The whole surveyed region is a refuge for quite interesting fauna. In the Patagonian shores you can see dense populations of nesting penguins, cormorants and other birds, and mating sea lions etc.. In the Uruguayan isle of Lobos there is a colony of thousands of the fur sea lion - an almost extinct species because the high price of its fur made it the target of hunters.

The point of most interest is the Valdes Peninsula (42-43°S). The British explorer and writer Gerald Durrell expressed his wonderment in his book "The whispering Land", when he visited the peninsula. Every year this Peninsula attracts multitudes of biologists and tourists (164,000 in 1998). UNESCO declared it World Patrimonium. This is deserved because in the gulfs surrounding the Peninsula, an amazing fauna congregates, especially for reproduction.

The main star is the southern right whale that arrives in number of 500-600 for mating. First the female gives birth, having conceived the previous year, and after a short nursing period they mate again. The birth of the babies, the spectacular jumps of the whales, their emergence and submergence all add to the show for tourists.

You can also see the killer whale attacking the young sea lions. And the giant of the pinipeds - the Sea Elephant (the adult males weight some 4 tonnes).

Now, how is all this connected with the fisheries? Quite simply, almost the whole of that sea life lives on one fauna, the one constituting the bulk of our fisheries. If this becomes exhausted that entire fauna is condemned to famine. The effects are reciprocal: the elimination of this competing fauna would enhance the fishing stocks. Thus it is necessary to act wisely basing our decisions on careful research.

Of course, the owners/investors of the fishing companies strongly argue for a war on this "parasite fauna". Joining them are other industrialists: an Asiatic company offering to kill hundreds of thousands penguins. Fortunately the offer has not yet been accepted.

In my opinion Uruguay found the right way of managing the colony of sea lions in the Isle of Lobos. They have succeeded in maintaining a healthy and stable colony, even obtaining a profit.

Final Words

I often mention abuses and illegalities perpetrated by foreign crews and authorities. Now I want to make it clear that I do believe that the most culpable people are IN ARGENTINA. These irregularities cannot be carried out without the co-operation of native influential accomplices.

The above facts show the imminent destruction of the SW Atlantic fisheries is near. They are rapidly joining the FAO list of destroyed world fisheries.

Which is next? I imagine it will be the Chile-Peru fishing grounds.

In conclusion, I would like to know whether the managers of these big fishing enterprises realise that their actions are suicidal? Evidently *Homo stultus* is not able to accomplish the final step of its evolution to *Homo sapiens*.

Prof. Enrique Balech, Necochea, Argentina. Prof. Balech is a world renowned scientist and author. His first publications appeared over 60 years ago.

Wembury Voluntary Marine Conservation Area

By Mandy Wilkinson

WEMBURY Voluntary Marine Conservation Area (VMCA) was established in 1981 by people and organisations with an interest in the area. They recognised that it had significant marine wildlife importance and was under a lot of pressure from visiting school groups, scientific research, people collecting specimens, other recreational activities and small scale fishing. Wembury is managed by an advisory group of 38 organisations which have different and sometimes conflicting interests.

Since 1981, during the summer months the Devon Wildlife Trust has provided wardens (funded initially by WWF-UK) to guide school trips to the area and carry out the aims and objectives of the advisory group. In 1994 the Wembury Marine Centre was opened to provide an educational resource that could amongst other things give visitors a glimpse of the rich nature of the area's marine wildlife and pass on local and general marine conservation messages.

Wembury VMCA lies six miles along the coast from Plymouth in the Southwest corner of the UK and stretches along four miles of coastline from Plymouth Sound to the mouth of the river Yealm. It extends from the line of high water springs out to the 10m depth contour.

The rocky shore and reefs of Wembury VMCA owe their rich and complex habitats and associated flora and fauna partly to the geology of the area. Tilted slates are interbedded with mudstones, siltstones and conglomerates to create an abundance of crevices and fissures. The aspect of the rocks shelters them from the surf and provide shade from the sun; perfect for rocky shore species. Rocky reefs such as Wembury reef are sheltered by the Great Mewstone, an island owned by the Ministry of Defence. Other areas are fully exposed to the wave action, so the overall result is an area comprising different communities and great habitat diversity.

Gullies, overhangs, rock pools and flat-sided boulders provide support to some unusual flora and fauna: corkwing wrasse build intertidal nests the size of oranges that are guarded by the males; Cornish suckerfish attach their eggs to the bottom of rocks; and cowries and painted top shells are found among the boulders. Rocky shore habitats, especially those at



Wembury, are unique in that visitors are guaranteed an encounter with a huge variety of colourful, diverse and sometimes rare wild animals and beautiful plants.

The area is very important for primary and secondary school trips from Plymouth and surrounding districts. Schools book their visit and the next step is an interactive talk at the school... "Okay, all put your hands in the air and spread out your fingers. Pretend you're an anemone! If you were, and if every finger was a tentacle, then you'd have 200 fingers (gasps!!!). And every one of your tentacles would have a little sting and an invisible dart. Pretend to be an anemone shooting out your darts at your prey passing by (lots of noise and 'piowing')!" One of the typical mimes that children join in with during a school talk.

The pre-visit talk provides children with a good basic knowledge so that they can get maximum enjoyment from their visit to the shore. Volunteers are recruited to work with the warden and take small groups of six to ten students on to the rocks and enthuse them with the amazing life in the rocky shore habitat.

The success of a visit may depend on work put in by the teacher beforehand, so teacher training days are held at Wembury. A teacher's pack has been developed with funding from WWF-UK to help plan lessons. It includes briefing notes and fact and activity sheets for children and contains titles such as "Who eats what?" and "What's that?".

Rockpool rambles most weekends are an important part of the wider awareness activities aimed at encouraging sensitive interaction with the marine environment. Other events including World Oceans Day and Marine Week also help open people's eyes to the wonders of the marine world.

Wembury Marine Centre also reaches a different audience - those not attracted to wandering over the rocks - so even if their only direct contact with the marine environment is sitting on the beach, the message that the area is special is still passed on. The interpretation boards next to the beach inform visitors about the area's conservation status, attractions and the Seashore Code.

Codes of conduct are distributed by the warden and volunteer wardens throughout the summer. As with all VMCA's, the protection of habitats and species relies on users following straightforward rules and advise. The Seashore Code outlines how to enjoy exploring the coast while putting minimum pressure on its wildlife.

Activities such as bait digging, peeler crab collecting and wrinkle picking are all discouraged because the indiscriminate turning of stones and non-back filling of holes can lead to loss of marine organisms. Shore anglers are handed codes of conduct and are reminded to put back territorial fish such as wrasse to prevent disturbance of their breeding success. They are also asked to take away their spare lines and weights.

Harder to warden is the amount of damaged "ghost" nets drifting into the area. The Great Mew Stone supports nationally significant populations of breeding cormorants and shags, but a number of birds are thought to drown in the nets every year.

Diving is an extremely popular activity, and one of the largest dive centres in Europe is within the VMCA. Divers are discouraged from collecting marine organisms.

Wembury VMCA was set up to protect the marine wildlife of the area and raise visitors' awareness of the local and national marine environment. Through helping to set up VMCA's, giving grants



David Bellamy the famous naturalist visits



Dolphin community arts day



Big nippers, little nippers community arts day

towards special projects and events such as World Oceans Day, WWF-UK, the Devon Wildlife Trust, The Wildlife Trusts and others increase the knowledge and understanding that all visitors gain when they come to marine areas. They start to realise that although on the surface the sea looks the same, the seabed and the sea combine to form a complex jigsaw of habitats.

Additional reading:

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Mandy Wilkinson was formerly a volunteer at Sherkin Island Marine Station and currently works for the Wembury VMCA.

Implications of Use of On-site Wastewater Treatment Systems for Houses in Unsewered Areas

By Donal Daly

EVEN the thought of writing on so called 'one-off rural housing' in the current climate brings to mind phrases like 'sitting duck', 'head over the parapet' or alternatively 'life is too short, why bother'. However, for those who mightn't agree with some of the views given below, keep in mind that neither I nor the GSI make the planning decisions! This article is based on my own experiences as a hydrogeologist looking at this issue over the last 15 years, and as someone with a rural background and a concern for the future of rural Ireland.

Summary of the Past and Present

- Over 50 million gallons of effluent are produced by on-site systems daily. This effluent is disposed of in the ground.
- Almost 36% of new houses in recent years are 'one-off', using on-site wastewater treatment systems.
- Effluent from on-site systems pose a threat both to human health and the environment.
- Conventional septic tank systems produce an effluent that is a significant hazard, particularly in terms of microbial pathogens (several million faecal bacteria per litre of effluent) and nitrogen (N) entering groundwater and surface water, and phosphorus (P) entering surface water. While effluent from advanced systems reduce the numbers of pathogens and the concentrations of N and P in effluent, and therefore reduce the risk of environmental pollution, the effluent nevertheless still poses a threat to human health and the environment. Also, advanced systems do not reduce the quantity of effluent.
- The degree of microbial contamination of groundwater in Ireland is very high. I am not aware of any other country in the EU with the same levels. The EPA recently recorded that 36% of samples tested contained faecal bacteria. In County Roscommon, 58% of samples from Group Schemes contained *E.coli*. It is likely that there are areas where more than 70% of private wells contain faecal bacteria at some time during their use. While the faecal bacteria themselves pose a threat to human health, particularly to babies and old people, viruses and *Cryptosporidium* may add to the threat. In my view, microbial pathogens are the single greatest threat to groundwater in Ireland. The two main potential sources are organic wastes from farming and effluent from on-site systems.
- The key factor in Ireland leading to this situation is that our bedrock is fissured and provides little purification, and there are many areas of shallow rock. The depth of subsoil over bedrock is the critical factor in keeping our groundwater clean and safe and the critical consideration in the assessment of potentially polluting activities, from a hydrogeological perspective.
- In Ireland, a significant proportion of the land surface (perhaps up to 40%) is not readily suitable for on-site systems. Two contrasting scenarios comprise this area:
 - Low permeability soils and subsoils, which become saturated in winter;
 - Outcrop and shallow bedrock, where the

soil and subsoil thickness is <2.0 m (in areas where the bedrock permeability is high, the groundwater is under threat; where the permeability is low, surface water is at risk);

- The reality is that there are many houses, including relatively new ones, where the effluent is either piped into streams or is getting into the ground too rapidly. (I have stayed in some of them while on holidays in the west of Ireland!)
- For many houses in rural areas, wells and on-site systems are (or for future houses, will be) on the same site or nearby. In other words, we are getting our drinking water from a point a few tens of metres away from where we dispose of our faeces and urine, leaving the potential for a particular form of recycling that is not recommended, as the zone of contribution of private wells often includes the area containing the percolation pipes. This is inherently risky, unless the ground conditions are suitable, particularly with regard to the depth to bedrock.

The Future

In the coming years, hundreds of thousands of houses will be built. Could continued permissions for houses in unsewered areas, particularly urban-generated housing, pose a significant risk to the environment and human health? There can be no doubt but that the answer is 'yes'. A more critical question is 'can the risk be mitigated or managed such that there is no significant impact?' The answer is 'it depends!'. What does it depend on? How can the risks be managed and minimised? Are there areas/situations which are not suitable for on-site systems?

My views and recommendations are as follows:

- It is vital that the EPA Manual (2000) and Groundwater Protection Responses (2001) should become the guidance documents for the location of on-site systems (for instance, in the Building Regulations), and in particular, for site assessments. Use of these documents will help ensure minimal environmental and health impacts and will discourage use of less suitable sites. I suggest that the Agrément Certificates should not apply to the site suitability aspects of site selection. In particular the Site Characterisation Form in the EPA Manual should be used for all site suitability assessments. I would recommend that those local authorities who are not already doing so should use the Site Characterisation Form at the back of the EPA Manual as a means of collecting the relevant information. This is also available on the EPA website (<http://www.epa.ie>).
- Good information on the 'ground' conditions is necessary as a basis for good decision-making. Groundwater protection schemes (DoELG/EPA/GSI, 1999), which compile and make available relevant geological and hydrogeological information, can be of great assistance. Proper site assessment and selection requires a multidisciplinary knowledge. In my view, no one profession, whether hydrogeologists, engineers, planners, environmental scientists or environmental health officers, have sufficient knowledge cur-

rently. Site assessors require specific training. This is being provided by a FÁS Course 'Site Suitability Assessment for On-site Wastewater Management', which is run jointly by the GSI and EPA. In the near future when sufficient numbers have been trained, I believe that before a site is deemed suitable, it should be certified by a 'competent person'. Therefore, future site assessors may require certification by FÁS to be deemed a 'competent' person.

- On-site systems, both conventional septic tank systems and advanced systems, should be installed under the supervision of a 'competent person' and certified by that person. Both systems can give problems if not installed properly and maintained. All effort in evaluating a site is totally wasted if the system is not installed as designed.
 - It has been argued that only advanced systems should be used in the future. I do not agree with this view. In a significant proportion of the country, where the subsoil is free draining ('T' values 1-50) and sufficiently thick (>3 m), I would recommend conventional septic tank systems, provided they are suitably located, installed properly and maintained (see Daly (2001) for discussion on this issue). However, there is still a large proportion of the country which would be deemed suitable using the EPA Manual - for instance, shallow rock areas and areas with 'T' >50, but with 'P' between 1-50 - where I personally would use, and my judgement would be to recommend, a reputable advanced system. Therefore, I feel that they have a vital role to play in the future.
 - I do not see 'groundwater pollution' being an issue in itself that would prevent permission being given for a house with an on-site system, unless the groundwater in the area has high nitrate levels, provided all of the requirements of the EPA Manual and the Groundwater Protection Responses are followed. Essentially sites can be 'engineered' to minimise the likelihood of groundwater pollution by microbial pathogens, even though it may be difficult and relatively expensive in some circumstances, such as in areas of outcrop and shallow rock. However, I would not advocate dependence on disinfection of effluent as the solution to microbial contamination of groundwater, as it cannot be guaranteed that the disinfection unit will be maintained.
 - In contrast, I believe that there are circumstances where the impact on surface water cannot be prevented in practice. These are as follows:
 - where both 'P' and 'T' values are >50 (a failed site according to the EPA manual);
 - where P is between 1-50 and T is >~80 (this value may vary somewhat depending on the circumstance, particularly the slope of the site). This circumstance is not explicitly deemed a failure in the EPA Manual - it is left to the expert judgement of the site assessor;
 - outcrop and shallow bedrock where the bedrock has a low permeability (typically many of the 'poor' aquifers, for instance, in the west of Ireland).
- In these situations, the effluent cannot

migrate underground at a sufficient rate to prevent ponding. The only option then is to discharge to surface water with a licence from the local authority. However, in the vast majority of circumstances, this will not be a viable option as there are seldom streams nearby with a sufficient continuous flow (especially in summer) to dilute the effluent adequately. In most hydrogeological settings, these areas correspond with poor aquifers where summer baseflow is low and consequently small streams dry up or have very low flows in summer (not to mention the fact that there are seldom flow data available). I suspect that there are many houses (I have seen several!) where effluent is piped directly into seasonal drainage ditches and small streams. Clearly these situations pose a threat to human health as well as impacting on surface water quality.

- While (a) using the EPA Manual and the Groundwater Protection Responses, (b) installing conventional systems on readily suitable sites and advanced systems on less suitable sites, and (c) having trained personnel available, represents great progress for the future, much of this progress will be hindered unless there is a massive increase in the level of enforcement and monitoring by local authorities. It would be particularly important that advanced systems should be monitored, as these are usually used in areas that are not suitable for conventional septic tank systems. Ideally the installation, inspection and maintenance of such advanced systems should be tracked to a local authority-held database. This might be incorporated as a planning condition. As resources to enable this to happen are not readily available, perhaps local authorities should be allowed to charge a sufficient planning application fee to cover the costs?

Summary

In conclusion, the management of the risks to human health and the environment of effluent from houses in unsewered areas depends on the site hydrogeology, proper site evaluation and selection by trained staff, use of appropriate technology, use of the EPA Manual and the Groundwater Protection Responses, saying 'no' when justified and, above all, enforcement and monitoring by local authorities. For the sake of our rural environment and the future health of householders in rural areas, let us give this issue a high priority and let us get on as soon as possible with the required changes.

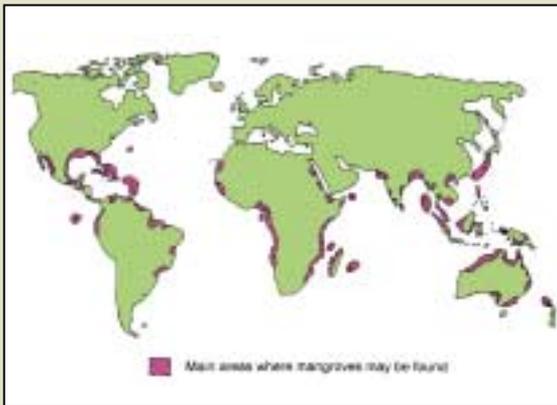
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Forests in the Sea

The Fascination of Mangroves



Fishing in a mangrove creek in the Philippines.

Photos © Jenifer Baker

By Dr. Jenifer Baker

THE term mangrove refers to salt-tolerant species of tree or shrub which grow on sheltered shores and in estuaries in the tropics and some sub-tropical regions. There are about 60 species which occur exclusively in this habitat, and some of them grow into magnificent trees over 30 m high. Mangroves may occur as narrow fringes on steeper shores and river banks, or as extensive forests on flat deltas - forests intersected with winding tidal creeks. You can walk

within mangrove forests at low tide (though often with difficulty because of the mud and the prop roots round the bases of some of the trees) but at high tide you can swim with the fishes who come in to feed.

Mangroves are outstandingly adapted to growing in seawater, which they desalinate by an ultrafiltration process. Mangrove roots typically grow in mud where it is difficult for oxygen to penetrate, and to overcome this problem many species have their own air conditioning systems - the underground roots receive oxygen through spongy aerating tis-

sue which communicates to the air through small pores on the trunks and the above-ground prop roots or breathing roots.

In optimum conditions mangrove forests are one of the most productive ecosystems, and from the beginning of history they have traditionally provided fish, shellfish and a variety of plant products for local communities. Fallen mangrove leaves are broken down by bacteria, fungi and herbivores, and the resulting detritus supports food webs including large populations of invertebrates and fish. The calm waters in the forest creeks

are ideal breeding and nursery grounds for young fish and shrimps, while the prop roots, lower trunks and mud surface usually support a varied fauna of oysters, snails, barnacles, crabs and other invertebrates. In some parts of the world ponds for aquaculture are excavated in mangrove areas. For example, ponds in southeast Asia are traditionally used for the culture of milkfish which are introduced as fry. The fish feed on algae and in some areas the yield is improved by green manuring using mangrove leaves. Products from mangrove trees include logs, fuelwood, charcoal, wood-chips, paper pulp, scaffold poles, piling and construction material, stakes for fish traps and fishing platforms, railway sleepers, wood for furniture making and carvings, material for roof thatching, bark for tannin, medicinal products, sugar, alcohol, acetic acid and dyes. In some areas modern exploitation for such tree products has increased to industrial levels, and the application of proper forest management practices based on cutting cycles and specially designed tree-extraction systems has been necessary in order to maintain a sustainable yield.

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



Avicennia mangrove, showing the ground covered in "breathing roots".

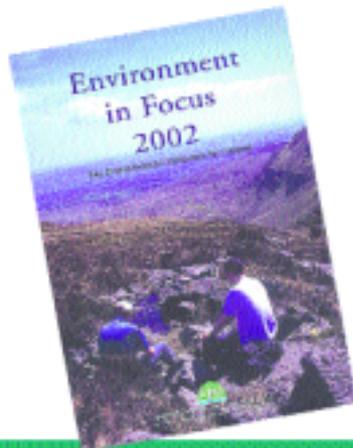


Environment in Focus 2002 - Key Environmental Indicators for Ireland

This recently launched report published by the Environmental Protection Agency provides concise information on the state of the environment, the main pressures coming to bear on it and the various measures being taken to address environmental problems.

Its purpose is to inform policy makers across all sectors about impacts on the environment and to help guide further policy development.

Environment in Focus is priced at €7 and is available from LPA Publications, Richview, Clonsilla Road, Dublin 14. Telephone: 01 2680100 Fax: 01 2680199



ENVIRONMENTAL PROTECTION AGENCY An Ghníomhaireacht um Chaomhú Comhshoil



Cutting mangroves for fire wood in Nigeria.



In the Philippines, a traditional fish trap in a mangrove creek.



A selection of molluscs from mangroves in the Strait of Malacca.

Forests in the Sea

The Fascination with Mangroves

Photographs: Jenifer Baker



Traditional fishing boat in a mangrove creek in Gabon.



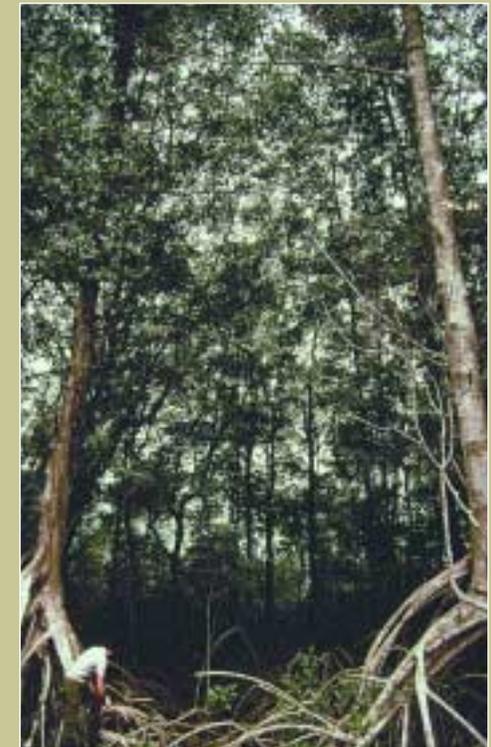
Traditional fish trap on the edge of a mangrove forest in Borneo.



Aerial view of a mangrove forest in the Niger Delta.



Mangrove roots, which are covered in oysters, on the edge of a creek in Nigeria. Inset: close-up of oysters.



In Nigeria, fully grown *Rhizophora* trees showing prop roots.

By Martin O'Grady

Habitat Degradation

Many causes of habitat degradation can be blamed on human interference such as increasing domestic and industrial demands for water and intensification of agriculture, leading to trampling of banks and excessive erosion. Fertilisers, and chemicals result in pollution which fish stocks battle to survive.

Different habitats are needed by salmonids at different stages during their lifecycle. It is essential that rivers and channels are maintained or

Impact of Habitat Degradation on Fish Stocks

LAND management practices have had a negative impact on many of our rivers and lakes. Rerouting of channels, changing their natural shape and the removal of bankside vegetation all have impacts on their capacity to support fish and all other forms of wild life.

rehabilitated to include the typical physical and ecological features, which accommodate salmonids throughout their life.

What is being done

The Central and Regional Fisheries Boards have been

well aware of these problems. Over the period 1995 to 2000 they invested over €20m in identifying problem areas and

designing and implementing solutions to riverine problems. This involved surveying 2,000km of riverine channel and carrying out rehabilitation programmes on over 400km of channel length. Rehabilitation river and stream reaches varied in width from as little as 1m to sections of the lower Cork Blackwater, which were 57m wide.

Natural materials (rocks and logs) were used to restore channels and subsequently repaired channels were always fenced off to allow the bankside vegetation to regenerate. Planting of native deciduous trees is a key element of many river enhancement programmes providing additional stabilisation to the bankside areas. Where flood relief demands an excavated channel, the construction of a

two-stage channel, confining summer flows to the original width can prove very successful.

Boulders placed on the bed will create scour channels, providing more individual territories.

The removal of obstacles is often the most cost-effective way of increasing available habitat. Fish passes can be expensive but provide access to large areas of good habitat on a permanent basis.

Fencing of bankside areas can greatly aid the rate at which vegetative recovery takes place once grazing pressure is eliminated.

Cattle trampling can double the width of a small stream, making it too shallow and muddy to support fish stocks.

Where instream and bankside stability is restored, there is a marked recovery in the aquatic flora, fauna, fish stocks and bird life.



The environment ● it's easy to make a difference



DESIGN BY GUNNAG



April 1999: Bank trampling by animals can cause serious damage to a river.



The same river one year later, healthy and protected by fencing.

Photos: © Central Fisheries Board



Picture: a vortex rock weir concentrates the flow to the centre of the pool, creating depth and providing cover.

Typically, four years after restoration works have been completed, increases will have been recorded in fish stocks.

In one case a 350% increase in one year old salmonids was noted. Additional bird species will be present and the physical form of the river will be a single channel, with good bank cover.

What should a healthy river look like?

General physical form: larger catchments contain a wide variety of channel types, which include certain typical physical or ecological features.

Clean and well-oxygenated water is essential for

salmonids, along with clean loose gravel for spawning.

In upland valleys, boulder-strewn riffle/pool sequences are important as spawning and nursery areas and are also likely to support resident stocks of small adult trout.

The deep water of pools provides shelter and refuge. Lower down, rivers tend to be slower and more sinuous. Riffles tend to form on either side of a bend, providing an area for salmon and trout to spawn.

River banks

Bankside vegetation will vary depending on altitude,

soil, rainfall and other climatic conditions. Vegetation needs to be maintained to prevent excessive bank erosion, to provide cover, food and shade for fish, to reduce high summer temperatures and to limit silt and fertiliser run-off.

Pool Restoration

The reconstruction of pools is often an essential feature of rehabilitation programmes. They can be constructed in different ways, although particular techniques are only appropriate in certain circumstances.

Pools are important for spawning opportunities in the

gravel, which accumulate at the tail of pool areas. Log weirs can maintain excellent pools in small streams, necessary for salmonids to rest and hide when they return to spawn and home to many salmon and trout over one year old during low-flow periods. In vortex rock weirs, flows are concentrated to the centre of the pool, scouring the riverbed, creating depth and providing cover.

Martin O'Grady, Central Fisheries Board, Balnagowan, Mobhi Boreen, Glasnevin, Dublin 9. www.cfb.ie

Environment in Focus 2002

THE recent report from the EPA, *Environment in Focus 2002*, is the second national environmental indicator report for Ireland. ENVIRONMENTAL indicators are key statistics that summarise a particular environmental issue. Their strength is in delivering concise, scientifically credible information, that can be readily accessed by decision makers. In essence their purpose is to simplify, to quantify and to communicate. In recent years the use of environmental indicators has emerged in the international arena as a powerful tool that can assist in measuring environmental performance and progress towards sustainable development and in influencing environmental policy.

It states that its main objectives are as follows:

- To help inform policy makers, both in the environmental field and across the key economic sectors, of the main environmental challenges to be addressed;
- To assist in evaluating the impact on the environment of existing national policies and measures;
- To assess Ireland's progress in meeting certain international obligations; and
- To help guide further environmental policy development where needed.

In 2000, the EPA published its *State of the Environment Report - Ireland's Environment: A Millennium Report*. This assessment reviewed how Ireland's record economic growth has given rise to accelerated pressures on the environment and it identified a number of environmental challenges facing Ireland as a result. The five main challenges identified were:

- Reducing pollution of inland waters;
- Managing waste and preventing litter;
- Protecting the urban environment, particularly from transport impacts;
- Controlling greenhouse gas emissions; and
- Protecting natural resources.

The selection of the 50 indicators for *Environment in Focus 2002* has centred around evaluating Ireland's progress in meeting these five key environmental challenges and assessing the effects on the environment of the main strategic economic sectors. Measuring Ireland's progress in meeting its international environmental obligations has also been an important influence.

The report is available from EPA Publications, Richview, Clonskeagh Road, Dublin 14, for €7.00.

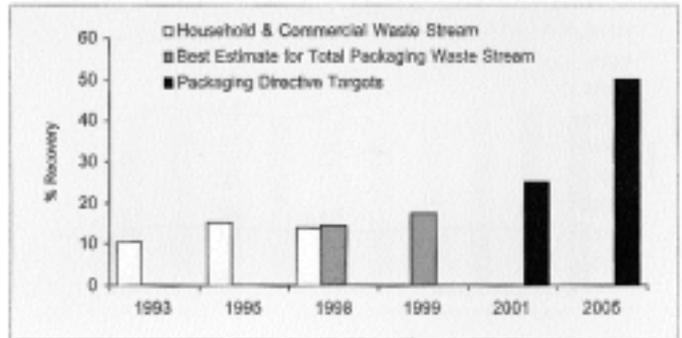
Packaging waste includes materials such as glass bottles, tin cans, aluminium containers, paper and cardboard. By December 2005, 50 to 65 per cent (by weight) of packaging waste is to be recovered with further stipulations concerning recycling rates of packaging materials. Targets can be achieved by energy recovery and recycling, however, owing to the absence of municipal waste incineration capacity in Ireland, these targets have to be met by recycling alone.

Waste management is one of the most problematic and challenging environmental issues in Ireland at the present time. The latest figures show clearly that waste quantities are continuing to increase. This increase places a severe pressure on the environment and on the existing waste management services and infrastructure. Almost 2.3 million tonnes of household and commercial waste were generated in Ireland in 2000 - representing an increase of almost 62 per cent in five years.

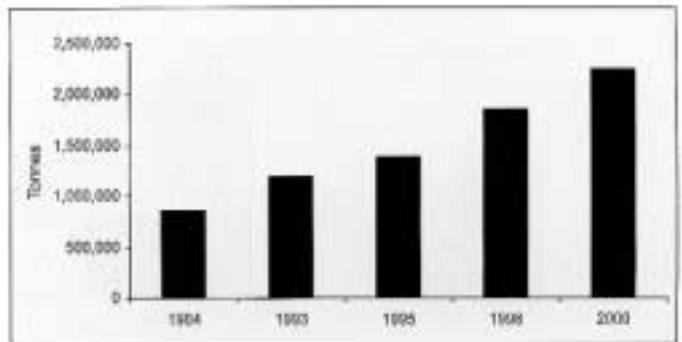
This indicator highlights the remaining licensed landfill capacity available within the various regions. Nationally, these are an estimated 10.38 million tonnes of landfill capacity available for municipal waste disposal. However, based on current municipal waste disposal rates, licensed landfill site capacity in Ireland will run out in approximately four and a half years.

Source: *Environment in Focus 2002* - EPA

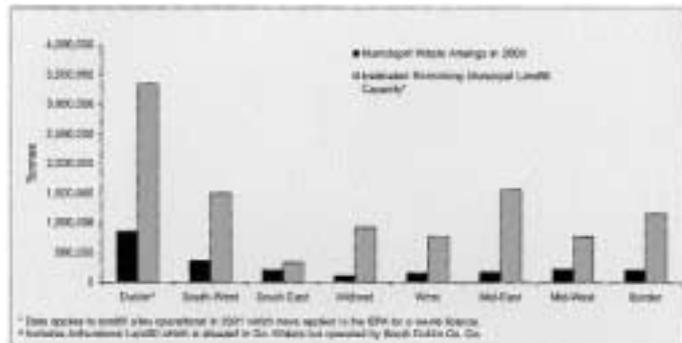
Some of the Important Indicators



Recovery Rates of Packaging Waste



Household and Commercial Waste



Remaining Landfill Capacity

After Thoughts by an American Regulator

By David H. Killoy

AFTER travelling around the Southwest and West of Ireland, (surviving driving on the left), and attending the Sherkin Island Conference in Carrigaline, Co Cork, I have entered that land government employees generally avoid like a minefield, retrospective thoughts on where we have gone wrong and what we are doing to make things right.

Ireland, on my brief, but unbiased, view appears to be at a point where the US was in the late 1940's and 50's. At that time in the US we had a booming post war economy, and optimism that good times would continue; a chicken in every pot and a car in the garage. Ireland appears to be in a similar condition at this time based on the changing conditions in Europe eliminating trade barriers and it's possession of a well educated work force capable of effective participation in high tech industries and associated service industries. In the early 50's we were at a crossroads with much of our traditional infrastructure still intact. Much of the population lived and worked in close proximity to their homes with their jobs within a short distance accessible by bus, trolley or even walking.

OUR MISTAKE is that we were entranced, beguiled, ensnared by the automobile and the new technologies and infrastructure that serve it. In this we generally dismissed and abandoned perfectly serviceable infrastructure such as railroads, trolleys, river and coastal transport to place most of our development into the automobile. We did this by embracing, without much thought, the fallacy that change is progress. An example of this was when designing a section of underpinning for the Washington DC subway system I encountered trolley tracks coming through the pavement in wide streets capable of carrying trolleys in both directions simultaneously. A multi-million dollar project was built to replace what we had within living memory and actually could have put back at much less cost.

This service to the automobile led us to a general disregard for the environment into which the highways, service areas, interchanges etc. would be inserted. After all highways were progress, they were good for business, they brought jobs, they brought families together and took them on vacation. Who would oppose them? If historical buildings and archaeological sites had to be demolished or moved how could this be allowed to hinder progress. Wetlands were cheap land to place highways on. Farms in existence for many generations could be bisected so long as the farmers received adequate compensation for the land used. Great vistas could be changed though the trace of a major highway passing through. Don't hide it, it's the mark of the future. Pogo Possum,

a late, lamented cartoon character, defined our dilemma when he said: "We have met the enemy and he is us."

In some ways our current problem was also driven by the Cold War Paranoia of the times in that our interstate highways system has as a major purpose it's use for national defense in transporting troops and supplies as required in wartime. Portions are even designed with geometry that allows them to be emergency airfields. What was not foreseen was their impact upon traditional land use patterns particularly at the entrances and exits. These have become prime sites for commercial and industrial development. This has often shifted the focus of local and regional economic and social activity away from existing defined, and often historically significant, town centres to these amorphous and often ill planned highway junctions catering to the automobile addicted public. Characteristically these are indistinguishable from each other throughout the US.

We did not start to pull our head out of the sand until the late 1960's, by which time it was apparent to large numbers of the citizenry that they were breathing bad air, swimming in polluted water and drinking it also. What we now refer to as "quality of life" was not what it had been in our youth. We then proceeded to attack the problem with enthusiasm but no clear direction. There are a great many interest groups with very a specific resource which they, justifiably, believe needs protection. They also often believe that their interest and resource is paramount. We put in place a large number of laws to protect specific resources such as the Clean Water Act,

National Fish and Wildlife Protection Act, Clean Air Act, National Historic Preservation Act, Endangered Species Act, etc., etc.. All of these are well meaning and have achieved some improvement in at least slowing down environmental degradation and in some cases reversing it. They also have contradictory and mutually exclusive aspects which, implemented by different agencies with differing internal philosophies and politics, delay the review and effective regulation of major infrastructure projects. This is often resolved through time consuming negotiation, posturing and chest beating by various interest groups until a compromise, usually with lingering dissatisfaction on all sides. These delays are usually at the expense of the environment and public frustration over the inefficiency of government.

I define an educated man as one who is aware of his own ignorance. In that perspective I will now suggest how Ireland might attempt to avoid the mistakes we have made in the US. At the National level a goal must be established that is clear, simple and endorsed by the majority of the Irish Public. Something to the effect of: "To protect, maintain and, to the extent possible, restore those

unique attributes of Irish culture, history, landscape, environment and tradition which define our people and our land." The goal however defined should be used as the guiding principle for national, county, and local laws and ordinances for all development. The Goal at the National level should result in passage of an Act, which will define the parameters to be used in assessing development project. It should also establish a regulatory agency to implement the Act with no connection to a particular interest group but a mandate to represent the general Public Interest in the implementation of the ACT. County and Local governments could pass complementary acts and administer them after the National Agency reviewed and concurred in their compatibility with the ACT. The ACT should include reasonable review timelines to prevent bureaucratic foot dragging and suitable compensation to land owners burdened in the public interest by restrictions on the use of their property. In all of the above it must be understood that it cannot be done small or on the cheap. Good people are the essential element and they have to be paid well and a lot of them will be needed.

In summary Ireland is at a fork in the road which will determine what it's children will have. I was reminded of the following poem by Robert Frost:

THE ROAD NOT TAKEN

Two roads diverged in a yellow wood,
And sorry I could not travel both
And be one traveler, long I stood
And looked down one as far as I could
To where it bent in the undergrowth.

Then took the other, as just as fair,
And having perhaps the better claim,
Because it was grassy and wanted wear;
Though as for that the passing there
Had worn them really about the same.

And both that morning equally lay
In leaves no step had trodden black.
Oh, I kept the first for another day!
Yet knowing how way leads on to way,
I doubted if I should ever come back.

I shall be telling this with a sigh
Somewhere ages and ages hence:
Two roads diverged in a wood, and I—
I took the one less traveled by,
And that has made all the difference.
Perhaps Ireland might take the road less traveled by.

David H. Killoy, P.E., C.P.G., Chief, Permits and Enforcement Section, Regulatory Division, New England District, US Army Corps of Engineers, 696 Virginia Road, Concord, MA 01742, U.S.A.



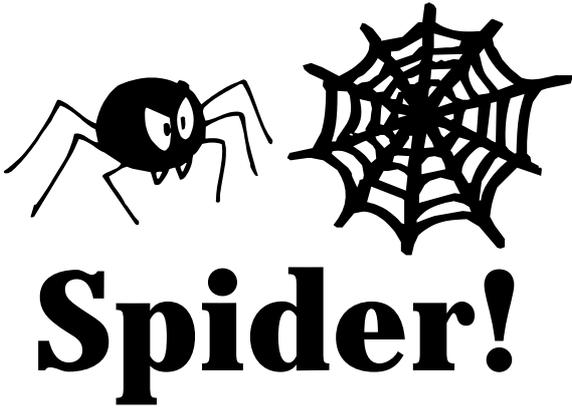
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Spider!

By John Akeroyd

FIRST let's come out of the closet: I am a confirmed arachnophobe. I can't bear spiders to walk on me, although I find them absorbing to watch (admittedly from a safe distance). I also appreciate their valiant work killing pests and maintaining ecological balance in the fierce world of mini-beasts. And I never harm them deliberately, even though they infest my office.

For spiders like offices, especially those with plenty of quiet corners behind book-cases and piles of journals. Occasionally I purge *Pholcus* or 'daddy-long-legs spiders' from the ceiling – I love how they agitate their tatty webs, as if in sheer fury, when disturbed – although they do decimate other invertebrates, including fellow spiders. I also remove the odd large *Tege-naria* house-spider or woodlouse spider (*Dysdera*), and my cat eats some plumper individuals. Then, one warm summer night, a spider overstepped the mark. Sleeping on the office floor (after a good supper with friends nearby), I awoke, my upper arm in fearful pain, as if from a wasp sting. In the half-light, I flicked away something dark and clingy – a large spider! Next morning, still in discomfort, I examined with a hand-lens a bruise-like patch on my arm – yes, a pair of pin-prick jaw-marks. The 'bruise', presumably broken blood-vessels, took a fortnight to disappear.

So, some months later when a springtime visit to southwestern Crete found me in Soughia, a miniature seaport of tavernas and holiday lets, I was wary of spiders. Having lived well for a few days, I decided to economise by renting a small whitewashed room over the police-station for about €10 a night. It was clean enough, but plaster was cracking where walls met ceiling. As a veteran Greek traveller, my immediate reaction was to

assess any room-mates. I climbed on a chair to inspect the cornice, but all was apparently in order!

That night I ascended the rickety stairs to my room. As soon as I opened the door and put on the light I spotted a slight but definite movement in a corner of the ceiling. Upon my arrival, a large spider had ventured forth from some snug hideout in the cracked plaster. He (probably she!) moved rapidly, smoothly and apparently purposefully towards me, as I stood in the centre of the room beneath the single bulb. I could see he had a fairly substantial body and wide-spreading, somewhat curving legs, which appeared to be wearing stripy rugby stockings in brown and yellowish-beige. I could fancy I could hear him shouting that

"No way could I sleep in the presence of such a professional – doubtless a much-decorated member of some arachnoid SAS – who would surely find his way on to me from above or below."

he was on his way to get me. Arriving almost over my head he stopped and instantly launched himself from the ceiling to abseil precipitously to the floor. He hit the deck running; and scurried beneath the bed. No way could I sleep in the presence of such a professional – doubtless a much-decorated member of some arachnoid SAS – who would surely find his way on to me from above or below. He was clearly a psychopath, and totally committed to frightening me to death at the very least, an impression amplified by the way he then launched himself at frenzied pace up the wall in the direction of my jacket, on a hanger suspended

from a nail. Keeping him under observation, I rushed to the wash-basin, grabbed a tooth-mug and trapped him against the wall. Fortuitously spotting a post-card within reach among my possessions on the bed, I slid it under him and he was my prisoner.

Much frantic scrabbling, with a hideous patter of tiny clawed feet on the card! I grudgingly admired his splendid hosiery, yellowish-brown mottling and greyish ovoid abdomen a centimetre and a half long. His rather lemony colouring reminded me of the patterns on the geckos that also share one's lodgings in the Aegean, sometimes a feature of ceilings at bedtime. Most notably, where honest creatures keep their bottoms, he had huge spinnerets – presumably the very font of his considerable abseiling skills. This gave a strong clue to his identity: a species of *Dras-sodes* or similar, a nocturnal hunter (its prey includes other spiders) that has conspicuous spinnerets. Unkind thoughts of pickling him in local raki came into my head. I felt he belonged in a museum, and he was clearly a threat, if only to their mental health, to visitors and locals alike. I imagined him a determined spiderling high on a gossamer, wafting across from Libya – North Africa is home to some quite nasty spiders – on a warm desert breeze. But he was probably perfectly indigenous, as all sorts of arachnids are native to Crete. I tossed him hard out of the window to seek his fortune in the mean streets of Soughia, suddenly panicking that I might have landed him on a passing reveller or, worst-case scenario, an irascible policeman.

I slept soundly that night.

Dr John Akeroyd has travelled in Greece for more than 30 years, mostly in search of plants but always with an eye on the animals and people.



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**Enda Gallagher,
Geological Survey of Ireland,
Beggars Bush,
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<http://www.estore.ie/home/gsiestore> for purchasing online

Alpine Flowers of Britain and Europe (2nd ed)

Collins Pocket Guide
By Christopher Grey-Wilson
& Marjorie Blamey

HarperCollins
www.fireandwater.com
ISBN: 0-00-220017-1
1995/£14.99 stg (pbk)

The mountains of Europe hold a rich and important assemblage of wild flowers. This standard work includes not only the gentians, saxifrages and louseworts of the high pastures and rocks, but also the plants more characteristic of dry grasslands in Alpine valleys, or of weed communities about settlements. The authors have wisely taken into account post-1990 political change, and this revised edition covers both western and northern Europe and the plant-rich Carpathian Mountains of eastern Europe. Poland, the Czech Republic, Slovakia, Hungary and Romania are now easy to visit and contain some of the finest stands of mountain vegetation in Europe. Here is HarperCollins at its best: authoritative text and elegant illustrations. This pocket guide is of the highest standard – and provides an indispensable companion from the Pyrenees to Iceland or Transylvania.

– John Akeroyd

Mosses, Liverworts & Hornworts

Compiled by Tomas Hallingbäck & Nick Hodgetts
IUCN/SSC Bryophyte Specialist Group
ISBN: 2-8317-0466-9

2000/£15.00 stg

Produced by the IUCN-World Conservation Union Species Survival Commission, this is a review of the status of bryophytes worldwide, with examples of habitats currently rich in bryophytes. These plants are often overlooked because of their small size and lack of conspicuous or colourful reproductive structures. However, they form an important component of ecosystems and can even have ornamental value, e.g. Japanese moss gardens. The Action Plan provides a focus for conservationists worldwide with an interest in mosses, liverworts and hornworts, and focuses on the classification of bryophytes, their importance and the threats they face. It looks at their habitats and gives regional overviews (each one focusing on a continent); and lists conservation

measures and recommendations. This is an essential reference for all botanists and ecologists interested in 'lower plant' conservation.

– Leander Wolstenholme

Water Treatment Manuals

Coagulation, Flocculation and Clarification

EPA Publications, Dublin
Regional Inspectorate,
Richview, Clonskeagh Road,
Dublin 14.

www.epa.ie
ISBN: 1-84095-090-0
200 2 / €20.00

The EPA has recently published a water treatment manual on coagulation, flocculation and clarification. It sets out the general practices that should be followed by those involved in the production of drinking water. It follows on from manuals on filtration (published in 1996) and disinfection (published in 1998). Where criteria and procedures are published by the EPA, pursuant to its powers under section 60 of the EPA Act, 1992, a sanitary authority must, in the performance of its functions, have regard to such criteria and procedures.

The manual provides practical guidance to those involved in plant operation, use, management, maintenance and supervision. There are chapters describing the processes of coagulation, flocculation and clarification in the manual as well as chapters on process control, record keeping, operation and maintenance and management and control. Detailed descriptions of the chemicals used in the processes are also included in the manual.

This manual will provide practical guidance to those involved in water treatment.

Management Plan for Polychlorinated Biphenyls (PCBs)

EPA Publications
(see above)
www.epa.ie
ISBN: 1-84095-095-1

2002/€7.00

In response to EU and Irish legislation, this publication provides information to users of old (circa

1989) electrical equipment on how to identify if that equipment contains PCBs. It also sets out legal obligations in relation to notifying, using, decontaminating and disposing of that equipment. PCBs are a group of organic chlorinated chemicals whose new use is banned and whose old use is being phased out.

The report entitled Management Plan for Polychlorinated Biphenyls (PCBs) is available from EPA (see above).

Wildlife Quiz and Amazing Facts

Don Conroy & Chris Wilson
Mentor Books, 43 Furze Road,
Sandyford Industrial Estate,
Dublin 18

www.mentorbooks.ie
ISBN: 1-84210-155-2

1999/€8.50

This is a fun book for wildlife lovers of all ages. Crammed full of facts from all aspects of animal and plant life, from worms to wallabies, boas to boars and zebras to zoonosis. Find out what is the greediest eater of all, if a barking spider really barks and if an elephant can really detect water underground.

This fascinating collection of facts will entertain for hours and will hopefully leave you with very few questions unanswered.

Rivers of Ireland A Flyfisher's Guide 5th Edition

Peter O'Reilly
Merlin Unwin Books, 7 Corve
Street, Ludlow, Shropshire SY8
1DB, U.K.

www.countrybooksdirect.com

ISBN: 1873674538
2002/£20.00 stg

Completely revised, updated, and with much new information, this deeply-researched guide to every trout and salmon fishing river in Ireland will now be even more useful to both visiting and local anglers.

This is the only comprehensive guide to Irish rivers available. It contains a description of each river, the game species present, the most

productive stretches, stock levels, average size, catch records, local permit requirements (names and addresses, emails, websites), best flies to use, open and close season dates, best fishing times of the year. This new edition also includes, for the first time, lists of local fishing guides and flytysers, important local tackle shops and details of disabled angler's facilities.

A Farewell To Greenland's Wildlife

Kjeld Hansen
Available from NHBS
Mailorder Bookstore,
2-3 Wills Road, Totnes, Devon
TQ9 5XN, UK.

www.nhbs.com
ISBN: 87-89723-01-5
2002/£15.00 stg

Kjeld Hansen, in this astonishing book, highlights the problems facing in Greenland from over fishing and over hunting. For more than 100 years the wildlife in this arctic environment has been over exploited. The Endangered Species List is growing and if something is not done within the next 20 years this destruction will be unreparable. Decisions need to be made now on how to repair the damage; there are many ways - close seasons, conservation areas, regulation of hunting methods and equipment, issuing of permits, applying quotas and the limiting of commercial sales. Hansen stresses that work must start immediately but it will take many generations to restore living resources.

How to Identify WEATHER

Storm Dunlop
HarperCollins Publishers
www.fireandwater.com
ISBN: 0 00 220202 6

2002/£12.99 stg

The weather can be difficult to predict at the best of times but this guide from the Collin's "How to Identify" series provides a detailed look at what to expect. With accurate details, diagrams and excellent colour photographs, it introduces the reader to the 10 major cloud types and the sub-types and vari-

eties. It describes cloud formation, shape, structure, transparency and how clouds are arranged in the sky. It explains about visibility, winds, precipitation, severe weather and weather systems and even helps the reader to understand weather maps and satellite images. By following each clearly explained section it is possible to see how cloud and wind can relate to forthcoming weather and may enable the reader to roughly forecast local conditions.

In Search of Nature

By D.A. Ratcliffe
Peregrine Books, J. & M.A.
Whitaker,
27 Hunger Hills Avenue,
Horsforth, Leeds, LS18 5JS, UK.
ISBN: 0 9536543 11

2000 £28.00 stg + £2 (p&p)

This book is fascinating. Derek Ratcliffe's tremendous love of nature is on every page. He begins with his boyhood summer holidays on his grandfather's 90 acre farm in Norfolk where he learned much of his early natural history.

What a wonderful youth Derek had, learning about plants, birds and insects, from self-taught naturalists of humble background who inspired and encouraged him. In 1956 he joined the British Nature Conservancy and spent his whole career with them. He takes the reader through the early years of his career, which was a wonderful adventure in the mountains and moorlands of Britain.

The Birdwatcher's Yearbook and Diary 2003

Buckingham Press,
55 Thorpe Park Road,
Peterborough, PE3 6LJ, UK.
buck.press@btinternet.com
ISBN: 0953384055
2000/£15.00 stg

This yearbook/diary is now in its 23rd year and is a must for all birdwatchers. Even though most of the information is for the birdwatcher in Britain, with national and county listings of bird and nature organisation and groups, it also has a comprehensive overseas section. The 2003 diary with events calendar and page per month for bird notes. The trade di-

rectory lists book publishers and other tradespeople serving bird-watchers. What is most interesting is a directory of over 80 lecturers who are available to talk to interested groups.

Vital Signs

The trends that are shaping our future 2002-2003

Earthscan Publications Ltd.,
120 Pentonville Road, London,
N1 9JN, UK.

www.earthscan.co.uk
ISBN: 1 85383 918 3

2002/£14.95 stg

This book focuses not on the spectacular events that dominated news coverage but on the deeper, more chronic trends that define the health of people and the planet. We learn that an estimated 150-300 million hectares of cropland - 10-20 percent of the world total - is now degraded. More than 2 billion people live in water-stressed countries in which water supplies are insufficient to meet food, industrial and household needs. It also outlines positive trends, for example that China is now a world leader in producing the compact fluorescent lamps and that wind energy generating capacity jumped 37 percent.

There are a host of key indicators listed with comments. Economic, atmospheric, environmental, health feature etc.. This book should be an annual purchase for anyone in decision-making, both in the public and private sector.

The status of natural resources on the high-seas

Available from IUCN
Publications Services Unit,
219c Huntingdon Road,
Cambridge CB3 0DL, U.K.

www.iucn.org
ISBN: 2-88085-250-1

2001/£12.00 stg

These proceedings highlight the issues that need to be taken into account in man's exploitation of the Oceans. Little is known of the effects of high seas fishing, dumping, mining or even scientific research. Some of the most valuable resources under threat are, seamounts, deepwater coral, sub-canyons, seabirds, cetaceans and fish stocks. In most cases we discover the impacts after the fact. The need for Marine Protection is discussed and suggestions are made. This book is essential reading for policy makers, fishing leaders and scientists.

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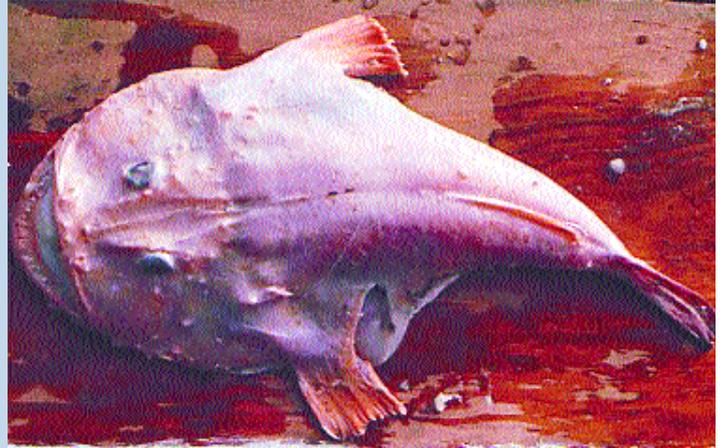
Monks Take On A New Habit

By Declan T. Quigley

TWO species of monk fish or angler fish occur in Irish and Northern European waters: *Lophius piscatorius*, the white bellied and *L. budegassa*, the black bellied angler. Although the geographical distribution of *L. budegassa* is centred in the Mediterranean, its range is now known to extend well into northern European waters. Nevertheless, it's occurrence in Irish and UK waters was only confirmed during the mid 1970's. *L. piscatorius*, on the other hand, predominates, particularly in inshore waters (<200m), and has a more northerly distribution. The main distinguishing features between both species are summarized in Table 1.

after 6 years is about 5kg. Spawning takes place during spring and summer in deep offshore waters (down to 2000m). The eggs are laid in ribbon-like gelatinous sheets which can be up to 9m in length and 3m in width.

Both species of angler have traditionally been taken as a by-catch in the mixed demersal fishery, although over the last decade, they have increasingly been fished for specifically with demersal gill nets. Annual commercial landings in Irish waters have increased from about 100 tonnes in 1977 to about 2000 tonnes in recent years and most of the catch is sold fresh to continental Europe. Although *L. piscatorius* accounts for the bulk of the total catch, its relative contribution has fluctuated between 65 and 85% between 1984 and 1990 and seems to be declining.



Xanthochromic black bellied angler fish *L. budegassa* from Mizen Head 1988

exhibiting xanthochromism (yellow/orange pigmentation) were examined by MAFF in 1993. They discovered that the eyes of the albino specimens were consistently rudimentary or deformed, while the eyes of the xanthochromic specimen were normal. They also noted that all of the specimens examined were heavily infected with the microsporean parasite, *Spraguea loyphii*, particularly the brain and peripheral nervous system. It was speculated that this heavy infestation of the nervous system might result in neuropathy, thus affecting epidermal and ocular tissues. Although the aetiology of the condition

still remains uncertain, the potential involvement of radioactive and non-radioactive contaminants or the possibility of genetic mutations appears to have been ruled out. Despite the fact that thousands of angler fish have been routinely examined at various locations around the Irish coast, the overall incidence of colour abnormalities still appears to be very low.

Declan T. Quigley, Carrigadrohid Smolts Ltd., Macroom, Co Cork. Mobile: 087-9080521; Email: declanquigley@eircom.net

Feature	<i>L. piscatorius</i>	<i>L. budegassa</i>
Colour of peritoneum	dark	light
Dorsal fin rays	11-12	9-10
Anal fin rays	9-10	8-9
Pectoral fin rays	24-26	22-24
3 rd cephalic dorsal spine	Long (11.6-19.9% of SL)	Short (7.8-12.4% of SL)
Spines above gill opening	2 (sometimes 3)	3
Small fleshy flap above eye	absent	present

Table 1. Main distinguishing features between *L. piscatorius* & *L. budegassa*

Angler or monk fish are so-called because they possess a fleshy fishing lure (esca) at the tip of a specially modified first dorsal fin ray (illicium) which they use to entice prey close to their cavernous mouths. The enormous head of the angler fish constitutes about half of its total length. A large well-concealed predator, angler fish lie motionless waiting patiently for prey to come close enough for them to engulf at lightning speed. Although both species feed on a wide range of fishes, particularly Norway pout, whiting, bib, poor cod, herring and *Nephrops* prawns, some unusual prey items have been found in their stomachs, including seabirds and a brass tea-tray!

L. piscatorius appears to grow to a relatively larger size than *L. budegassa*. The largest specimen captured on rod and line in Irish waters weighed 42kg (Belfast Lough, 1985). The mean weight of *L. piscatorius* in the north Irish Sea

The colouration of angler fish is very variable, dorsally; ranging from reddish-brown to greeny-grey with irregular markings, while ventrally; the colouration is usually white, with black/grey edges on the fins. It is interesting to note that a number of unusually coloured angler fish have been captured during the last couple of decades in various parts of the NE Atlantic (including Irish, UK, French and Spanish waters) as well as the Mediterranean. Indeed, an albino specimen of *L. piscatorius* was recently reported from Castletownbere, in the November issue of both The Marine Times and The Irish Skipper. Details of all know records of unusually pigmented angler fish recorded in Irish waters are summarized in Table 2.

Several abnormally pigmented angler fish from SE Ireland and SW England, including specimens of both *L. piscatorius* and *L. budegassa* exhibiting albinism and *L. budegassa*



Albino white bellied angler fish *L. piscatorius* from Dingle Bay 1995

Species	Date	Location	T.L. (cm)	Weight (kg)	Pigmentation
<i>L. piscatorius</i>	25.04.1990	NW Skelligs	63.0	2.695 (gutted)	albinism
<i>L. piscatorius</i>	November 1994	Dingle Bay	63.5	3.300	albinism
<i>L. piscatorius</i>	August 1995	Dingle Bay	51.0	1.625	albinism
<i>L. piscatorius</i>	October 2002	Castletownbere	-	2.000	albinism
<i>L. budegassa</i>	December 1988	Mizen Head	59.5	3.047	xanthochromism

Table 2. Irish records of unusually pigmented angler fish



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Photos © Declan Quigley

Teesmouth National Nature Reserve

Industry and Nature in Partnership



Oystercatchers foraging in a tidal pool, North Gare.



Salt water lagoon, steel works and oil refinery.

By Anthony Toole

TEESSIDE, in the North-east of England, is one of Britain's major regions for heavy industry. Most of this is concentrated around the mouth of the River Tees. To the north is the port of Hartlepool. Between this and Middlesbrough, to the south, stand oil terminals, storage depots and refineries. There are jetties for the handling of containers and iron ore, a steelworks, a nuclear power station and one of the largest chemicals manufacturing complexes in Europe.

Surrounded by this industrial landscape, and dominated by it from every viewpoint, is the Teesmouth National Nature Reserve. Not only does nature survive in this most unlikely of settings, under the watchful eye of English Nature, it thrives.

Industry is not new around the Tees estuary. In medieval times, sea water was evaporated to obtain salt. Defensive banks against the tides were built and the land, upon which the modern industries stand, was reclaimed.

A few miles to the west is Stockton, from which in 1825, amid the earliest rumblings of the Industrial Revolution, the world's first commercial steam railway service carried passengers and freight to nearby Darlington.

During the period of heaviest pollution, in the nineteenth century, wildlife maintained the most precarious foothold around Teesmouth. With the clean-up of industry during the latter half of the twentieth century, it began to move back.

In 1966, Seal Sands and the

dunes to the north of the estuary were notified as Sites of Special Scientific Interest. Much of this area was declared a National Nature Reserve, by English Nature, in 1995. In view of its importance in bringing nature to the general public, the site has been given the status of Spotlight Reserve, one of only 31 throughout England.

Teesmouth National Nature Reserve covers more than 350 hectares on the north bank of the Tees estuary. It lies in two sections, separated by Seaton Channel. The north side of the channel forms the southern boundary of the Hartlepool nuclear power station. This in

"Teesmouth is a shining demonstration of how successful co-operation rather than confrontation with industry can be in preserving and enhancing thriving habitats for wildlife."

turn is flanked on two of its remaining three sides by North Gare, an area of salt marsh, old sea wall and coastal sand dune.

Seal Sands comprises the southern half of the reserve, and is the largest region of intertidal mud flats between the Humber and Holy Island. Throughout the year, it provides a sanctuary for migrating waterbirds.

The path from the main road to the edge of Seal Sands follows, for half-a-mile, the southern bank of Greatham Creek. This is tidal, and when the tide is out, shores of grey-brown mud, fringed along their upper limits by bladder wrack, slope down to the slug-

gish water. Here, redshank and dunlin wade through the mud, pecking for invertebrates, while teal and the occasional little grebe paddle the stream.

Here also, even on the coldest days, seals bask in easy view of motorists, though the approach of a pedestrian will send them sliding back into the water.

As a result of pollution and hunting, seals became extinct on the Tees Estuary by 1860. A century later, common and grey seals began to return, and by the late 1980's the common seals had started to breed.

"Around four or five pups are born each year," says Mike Leakey, English Nature's site manager. "This is a smaller number than we would expect from a population of about seventy, but it is steady, and we monitor the numbers closely. Teesmouth remains, so far, the only regular breeding ground for common seals on the north-east coast of England between Lincolnshire and Lindisfarne."

Skilled volunteers have carried out a detailed bird count every month for the past twenty years, so that estimates of bird numbers are reliable. These reveal that more than 20,000 individual water birds visit the Estuary during a given year. Twenty years ago, the number of wintering shelduck was around 2000, but this total has fallen steadily to only 500 birds.

"We don't know for certain why this has happened," comments Mike Leakey, "but a shift to coarser, sandier sediments is implicated, along with the growth of mats of smothering weed over the tidal flats. In contrast, during the same period, the cormorant population has risen nearly eightfold."

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The industrial ambience creates some unexpected opportunities for birds. Security fencing around industries bordering the National Nature Reserve limits disturbance by deterring visitors from some areas, while the lighting enables waders to feed throughout the night.

A bird-watching hide at the south-west corner of Seal Sands gives a panoramic view across the mud flats. To the east, steam clouds rise above the steelworks, seeming to match in volume the natural clouds that hang over the backdrop of the Cleveland hills. To the north, the power station appears almost clinically clean. And dotted around the intervening quadrant, at any time of the year, are the birds.

In winter come knot from the Arctic, teal and shelduck. Spring brings ringed plovers and sanderlings, while in summer sandwich terns come to feed. As the year moves toward autumn, curlew, redshank and cormorant replace many of these. Even raptors, such as merlin and peregrine search for prey across Seal Sands.

The cleaning-up of the river has led to an unforeseen problem, in that mats of weed are now covering much of Seal Sands. "This," says Mike Leakey, "makes feeding difficult for birds as it not only reduces the number of invertebrates on which many of the waders feed, but also makes it easier for those invertebrates that are present to hide from the birds."

To the south of Seal Sands, English Nature has created a tidal lagoon known as the 'Intertidal Project'. Constructed in 1993, this functions by allowing a controlled flow of water through a pipe in the sea wall. Invertebrates, brought in by the tides, attract birds like redshank, curlew, grey plover and oystercatcher to the muddy margins, while shelduck, and teal feed in the shallows. A second hide affords good views to bird-watchers.

The sand dunes and grazing marshes of North Gare offer a

different environment where skylark and meadow pipit nest. Lapwing and flocks of curlew often dozens strong stalk the pastures alongside the approach road. Short-eared owls find a rich source of food among the dune grasslands.

In summer, flowers dominate the scene at North Gare. Lady's bedstraw, bird's foot trefoil, vetches and four species of orchid grow among adder's tongue fern and rare grasses. These attract butterflies and moths, many of them rare, along with several varieties of beetles, spiders and snails.

English Nature is to introduce a carefully controlled system of grazing by Hebridean sheep. This is intended to keep the strong-growing grasses in check, while allowing the flowering plants to proliferate.

Beyond the barrier of the dunes lie more sand and mud flats. Here, oystercatchers forage for cockles and sanderlings race the waters at the tide's edge. In the distance, the surreal view of a ship sailing out of the Tees recalls images of tankers passing through Suez.

English Nature maintains strong contacts with industry, and along with companies such as British Energy, Phillips Petroleum, BP, Northumbrian Water, Tees and

Hartlepool Port Authority and BASF, has formed the Teesmouth Industry and Wildlife Partnership. These companies together donate £25,000 each year toward management of the National Nature Reserve.

Teesmouth is a shining demonstration of how successful co-operation rather than confrontation with industry can be in preserving and enhancing thriving habitats for wildlife. It provides a model for what can be achieved elsewhere.

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



Seal Sands and Hartlepool Power Station.



Photo: © Robbie Mumby

Lady's Bedstraw



Seal Sands backed by the Teesside Iron and Steel Works.

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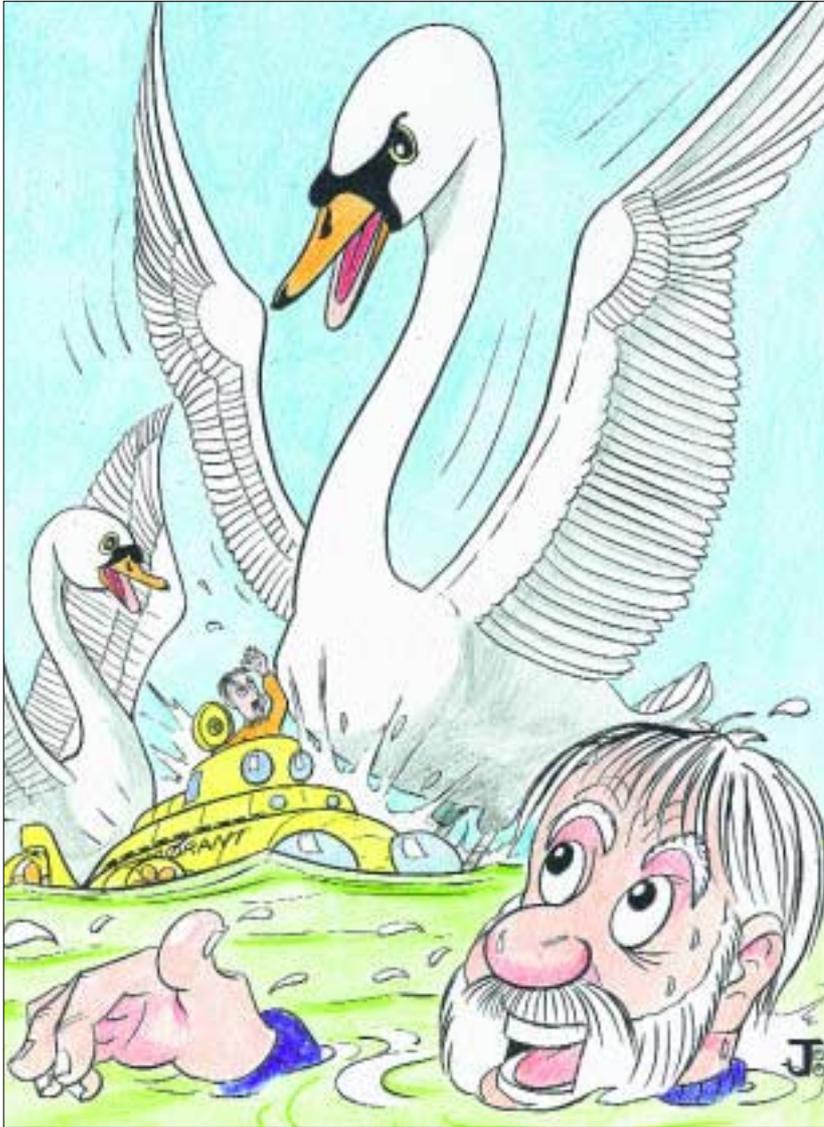
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Captain Cockle and The Pond

Abridged in four parts - Episode Three - ATTACK OF THE SWANS



By John Joyce

THE STORY SO FAR: Captain Cockle, along with his wife Dr Catherine Cockle and their grandchildren Jenny and William, have been accidentally shrunk to the size of sausages when their amazing flying submarine Cormorant was struck by lightning. While William and the Captain are busy trying to find a way to get them all back to full size, Jenny and Dr Cockle have gone off in search of Captain Cockle's ROVER remote camera, which has been taken to a giant farmhouse in the stomach of a pike, and been attacked by a giant rat . . .

Jenny couldn't take her eyes of the horrible brown teeth as the rat peeled back a large piece of aluminium from the cola tin they were hiding in and poked its head inside. The wriggling snout hit Dr Cockle in the ribs and its mouth opened . . .

All at once the rat jerked in surprise as it was caught from behind. Its jaws clapped shut on empty air and the rat, still stuck in the can, swung upwards until its head was staring down at them from above. Something had the rat by the tail and was swinging it too and fro.

"Whatever is it?!" yelled Jenny.

The rat slid backwards out of the hole in the tin. Above it, with flapping wings larger than a Jumbo jet was the most enormous magpie they'd ever seen.

For an endless second they listened to the wind rushing through the torn metal as the can fell to earth, gave a bone-crunching "smash" and rattled to a stop on the soft grass of the lawn.

"Are you all right, Granny?"

Dr Cockle pulled herself off the sticky metal and rubbed her head.

"I'll live," she said. "Quick, let's get out of here before the magpies come after us!"

The vast slab of the cottage door swung inwards,

leaving a huge opening that towered above them. Dr Cockle took one look at the watching magpies, one look at the opening door and yelled to Jenny.

"Come on, run to the corner of the door and slip inside!"

They found themselves inside an enormous kitchen, where a giant woman was standing by a solid wooden table as big as an oil rig. Its curving brown legs rose smoothly from the floor to its vast wooden top, and on a slab of wood, like a beached whale, was the dead body of the pike that had swallowed ROVER. The woman gutted it, put the guts into a bowl for her cat and placed the bowl on the floor. Then she lifted the enormous pike into the air and dropped it into the sink. There was a ringing boom as it hit the metal and a clatter of water as the great taps were turned on to wash the fish.

"If that woman leaves, can we get ROVER back from that bowl, Granny?"

But Dr Cockle was watching the water flood into the sink and listening to the roaring rush as it surged down the plug hole.

"I wonder where that drain goes?" she said softly.

Back on the Cormorant, down at the pond at the other end of the drain, Captain Cockle and William had finished checking the submarine's batteries and were taking a breather on deck.

"There!" said Captain Cockle. "Now all we have to do is find another source of electricity and we can recharge them again."

"What's that noise?" asked William.

Suddenly the whole tunnel was filled with a wall of churning, rushing water that swept over the nose of the Cormorant, pushing it out of the pipe into the open on the pond and throwing Captain Cockle into the water!

"Don't panic William. I'll swim back to you!"

"Behind you, Grandad! Behind you!"

From over Captain Cockle's left shoulder came a thundering hiss. He turned his head and found himself staring into the angry eyes of a giant pair of swans!

Very carefully, with her eyes fixed on the partly open kitchen door, Dr Cockle led Jenny along the base of the cupboard towards the great enamel cat dish, took out a sharp scalpel from her medical bag and began slicing carefully at the huge muscular sac of the fish's stomach. There was a ripping, wet, sucking sound, and out popped the small orange torpedo shape of ROVER, together with a dozen gallons of foul-smelling greenish fluid that slopped and splashed all over their shoes.

"Oh no!" moaned Jenny. "I'll never be able to get rid of the smell!"

From beyond the door to the garden came a soft, padding thud, thud, thud. The clear door of the plastic cat flap suddenly went dark and then burst inwards. There was a sudden rush of tortoiseshell fur, a heavy thump as four enormous paws hit the floor, and Dr Cockle and Jenny were staring into the dark slit eyes of a cat larger than the largest lion that ever stalked the earth.

Will Dr Cockle and Jenny end up as cat food?

Find out in the next episode - Escape - only in Sherkin Comment.

Abridged by the author from "Captain Cockle and the Pond" published in Ireland by Poolbeg Press and available from all good bookshops.

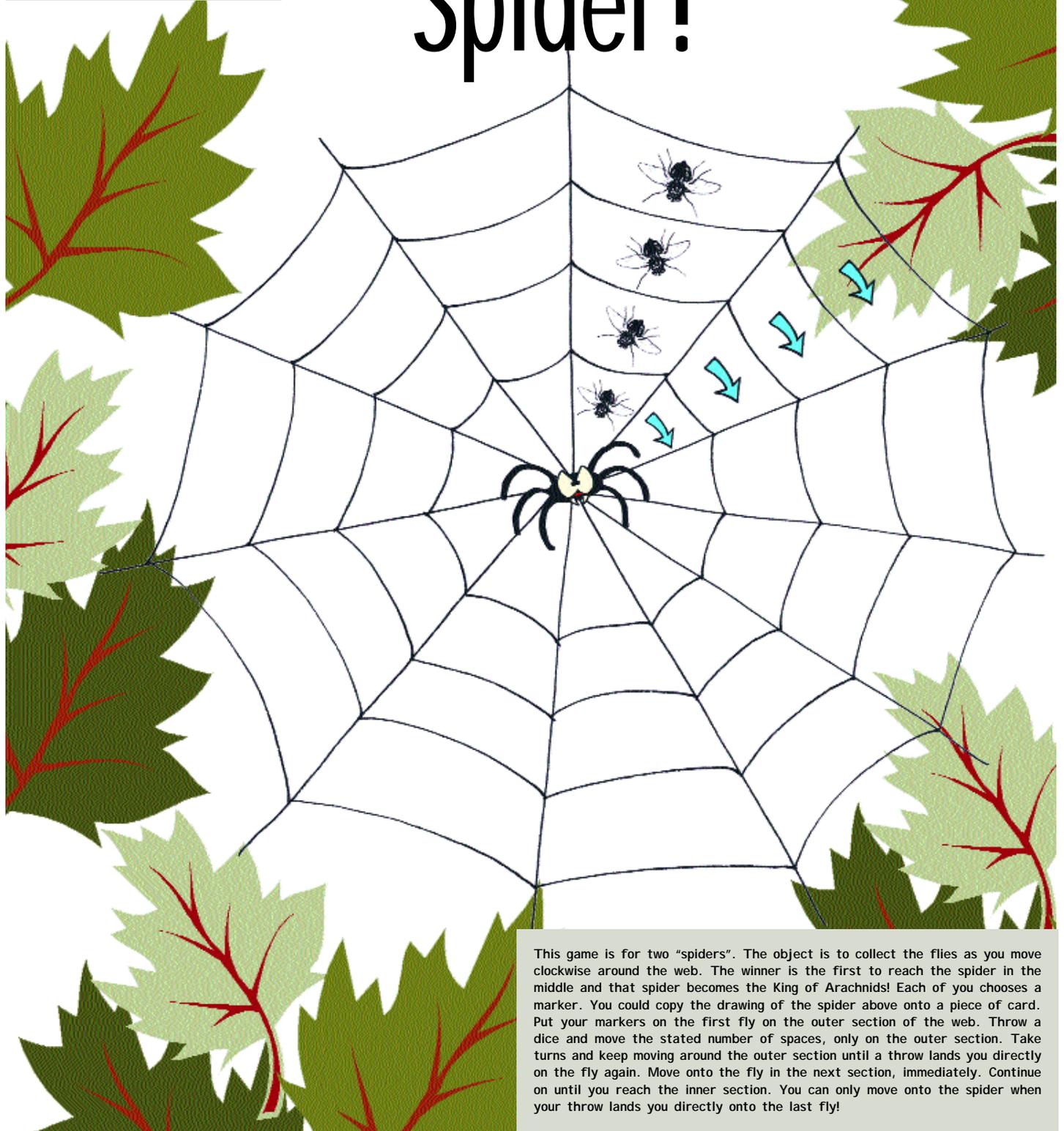
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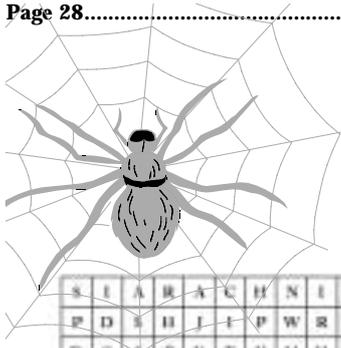
SPIDERS belong to a groups of animals called Arachnids. This group also includes animals such as scorpions and mites.

Here the spider has woven a web to catch some flies to eat. The web is sticky so the flies cannot move once they are caught. The spider will not stick to its own web because it has an oily liquid on its feet.

Itsy Bitsy Spider!



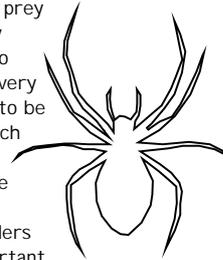
This game is for two "spiders". The object is to collect the flies as you move clockwise around the web. The winner is the first to reach the spider in the middle and that spider becomes the King of Arachnids! Each of you chooses a marker. You could copy the drawing of the spider above onto a piece of card. Put your markers on the first fly on the outer section of the web. Throw a dice and move the stated number of spaces, only on the outer section. Take turns and keep moving around the outer section until a throw lands you directly on the fly again. Move onto the fly in the next section, immediately. Continue on until you reach the inner section. You can only move onto the spider when your throw lands you directly onto the last fly!



Spider, Spider

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

MENTION **spiders** and a shiver runs down many peoples' backs! Most people think they are dangerous and wipe them away with a cloth, suck them up with the vacuum cleaner or squash them with a newspaper. Spiders do use **poison** or **venom** to kill their prey but Ireland doesn't have any spiders that are poisonous to humans. In fact, there are very few spiders that are known to be poisonous to humans. One such spider is the **Black Widow Spider** but none of these are native to Ireland!

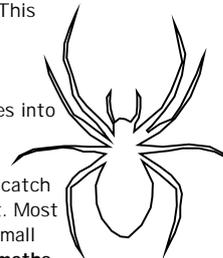


Insects are the prey of spiders and spiders play a very important role in our **ecosystem** as they catch insects that can be annoying and harmful. Many people think spiders are insects. In fact they are not. They do, however, belong to the same group (or phylum) in the animal kingdom - **Arthropoda** (which consist of animals, with **segmented** bodies and **jointed legs** or arms).

INSECTS vs. SPIDERS

Insects usually have three pairs of legs - spiders have four pairs (making it **eight legs!**). The insect's body is segment into three parts - the spider's body has only two segments. Insects usually have two compound (complex) eyes - spiders have **eight simple eyes**. Insects usually have antennae - spiders do not. Insects usually have wings - spiders never do. Insects can eat plants - spiders never do.

Spiders belong to a group called **Arachnids**, and this group also includes scorpions and mites. Spiders produce **silk** which they use to make houses, diving bells, cocoons, traps, parachutes and lifelines to save themselves if they fall. Organs called **spinnerets**, which are on their abdomens, or undersides, make the silk. At first the silk is a liquid and is made in certain glands in the body. This liquid is forced out through many little holes in the spinnerets and as soon as it reaches the air, the silk dries into a line that looks like a long strand of hair. This silk is **sticky** and it allows them to catch insects that brush against it. Most spiders spin **webs** to catch small flying insects such as **flies, moths** and butterflies. They poison their victims with venom from their **fangs** and wrap it in the silk threads to be eaten later.



Look for all the words in bold on this page in the wordsearch box above. (Answers on page 11)

Can you rearrange the letters below to spell the name of the group to which spiders belong?

(Answer on page 11)
H D A S A R N C I

Did you know...

...a spider sheds its skin a number of times throughout its life. This is called moulting. The new skin hardens each time.

...that if a spider breaks a leg in a fight, it can grow a new one when it moults.

...spiders will eat other spiders!

...a person studying spiders is called an arachnologist.

...baby spiders are called **spiderlings**.

...a spider can lay up to 2,000 eggs in their reproductive **sac**.

...spiders do not have an inner skeleton but an **exoskeleton** (a skeleton on the outside).

...there are more than 30,000 different types of spiders known to man!

...spiders taste and smell with their feet.

...spiders don't have teeth, they have fangs.

...their fangs hold their poison, which they use to paralyse and kill their victims!

...triangle, **orb**, funnel, tangled and sheet are all names for webs.

...the **thread** of silk a spider hangs from is called a **dragline**.

...claws and pads on their legs enable spiders to run up walls and along ceilings.

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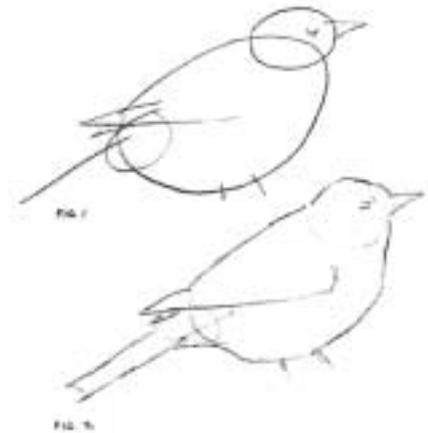
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Fieldfare



ONE of the most attractive members of the thrush family is the colourful fieldfare.

A winter visitor to our shores, it is usually found in flocks often mixed with redwings and our own resident song thrushes and mistle thrushes. It has a grey head, a reddish-brown back, a grey rump and a black tail. It's under parts are orange-buff with a white belly. It's bill has a yellow base to it.

They will feed in loose, scattered flocks over farmlands, or may be seen in hedgerows feeding on berries. They will also frequent parks and football pitches. Orchards can be very important for these birds if the weather is severe, where they will feed on rotting fruit. If you would like to help feed birds in very cold weather, use our Bird Care Recipes given below.

Here is a sketch you might like to tackle. Pencil in the basic egg shape and then build up as in fig. 1. The detail was put in with a thin brush and a fine tipped pen. Good luck!



Produced by Don Conroy for ENFO

These fact sheets, along with other fact sheets, are available from ENFO - The Environmental Information Service, 17 St. Andrew Street, Dublin 2. Tel 1 890 200191 (price of local call) Fax 01-8882946 Email: info@enfo.ie Fact sheets are also available at their Website: www.enfo.ie

Bird Care Recipes

Bird Cakes

Before you start, remember when you are cooking the bird cakes, you must always get an adult to help you. Also, ask an adult to help you when you are hanging the cakes and containers outside.

Basic Pudding 1

Ingredients: Seeds, peanuts, cheese, porridge oats, dry cake, scraps & melted fat (Rough quantities: 2lbs of mixture to 1lb of fat)

Put the mixture into a container and pour the hot melted fat over the mixture until it is covered and leave it to set. Turn out onto a table, unless you have prepared it in a tit-bell or coconut holder.

AVOID: Dessicated coconut - it swells inside the bird and can kill it
Salted peanuts - they make the bird very thirsty.

Basic Pudding 2

Ingredients: 3 cups porridge oats, 1 cup currants, 1oz grated cheese, 1oz canary seed, 1/2lb of fat or margarine.

Melt the fat and stir in all other ingredients. Pack into margarine tubs or other suitable containers. Allow to set and then hang up. (If you put a piece of string through two holes in the bottom of the container, it will help you to tie up the pudding when the mixture has set.)

Seed and peanuts

Wild bird seed can be purchased and placed on bird tables or on the open ground to encourage a variety of birds to visit the area being watched. Peanuts can also be purchased and placed in a nut container that can either be hung from a bird table, twig or outside the window. Remember not to use salted peanuts and keep food containers away from cover where cats and other predators could hide.

Apples and scraps

Thrushes, larger birds and even Blackcaps often prefer to feed on the ground. Be sure to spread the food out in the open, where the birds will be safe from predators. An apple pegged to the ground with a thin stake, to prevent it being moved by larger birds, can often give additional pleasure to the observer who can watch the birds for a longer period of time.

Do NOT forget WATER

Birds need to bathe even in the coldest weather to keep their feathers in good order. A shallow dish or an inverted dustbin lid will do. (You could make or buy a more elaborate structure if you like). Remember to break the ice on those cold mornings. A night light under the container creates enough warmth to keep the ice away but make sure the water itself does not get heated.

Do NOT give up!

Once you start to feed birds, you must continue to do so on a regular basis. Small birds will come to rely on this source of food. In a really harsh spell of weather it is the hunger that kills, not the cold.

Summer feeding

Recent thinking on the summer feeding of birds has changed. Certainly, feeding of scraps, nuts and seed will do no harm. (It is advised not to feed bread during this period - March to July). Those birds that continue to take the food will welcome the ease of obtaining additional supplies. Those species that make use of insects for feeding young or who have other dietary requirements will continue to do so and will not be harmed by this additional supply of food.

Produced by Don Conroy for ENFO

Looking for information on the Environment?

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there are now 7 easy ways to make contact with ENFO

1. **Write to:** ENFO, 17, St Andrew Street, Dublin 2.
2. **Telephone:** 01-8882001 or 1890 200 191 (local).
3. **Fax:** 01-8883946.
4. **E-mail:** info@enfo.ie
5. **Website:** www.enfo.ie
6. **Visit:** The drop-in centre at 17, St Andrew Street, Dublin 2 (off Dame Street) and see the exhibition, visit the children's corner, see environmental videos and access the library's database and internet facilities.
7. **Check out:** The ENFO information stands at your Local Authority office or County/City Library.

Forthcoming Exhibitions

February/March 2003:	ESAT Young Scientist Competition Prize Winners
March 2003:	Annual Tree Week Exhibition
24 March - 5 April 2003:	An Taisce in association with ENFO, an exhibition to mark National Spring Clean Month.

Schering-Plough are delighted to continue their association with Matt Murphy and his staff at Sherkin Island Marine Station on the production and continued success of the informative and entertaining *Sherkin Comment*.

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Irish Fish Stew or Chowder

This a wonderful dish on a chilly day. Use a combination of fish and vegetables.

If you can, add a little carrageen for a taste of the sea.

Ingredients

- 450g/1lb cod or other whitefish cut in cubes
- 225g/8oz shellfish - mussels, cockles, squid, etc.
- 2 tablespoons oil
- Selection of winter vegetables - onion, garlic, carrot, celery, potatoes - chopped
- 450g/1lb fresh or tinned tomatoes
- 570 ml/1pt water or stock
- Salt and freshly milled pepper
- Lots of chopped parsley
- 7g/¼oz carrageen - optional



*David J. McCarthy's
Irish Sea Fisheries Board*

Method

- Heat oil, add all vegetables except tomatoes and potatoes.
- Season well and cook without colouring over a low heat for 5-8 minutes.
- Add tomatoes, potatoes, carrageen and stock. Simmer for 10 minutes.
- Add fish. Cook for 2-3 minutes.
- Check seasoning and add lots of parsley before serving.

** You can substitute all kinds of fish and shellfish.
Serves 4 - main course.*



Environmental Competition for Primary School Children in Munster 2002



THE response to Sherkin Island Marine Station's Environmental Competition for Primary School Children in Munster for 2002 was wonderful. We were delighted to have Cllr. Paula Desmond, Mayor of Cork County, presenting the prizes at the prizegiving ceremony at the Carrigaline Court Hotel, Carrigaline, Co. Cork. Here is a very small selection of some of the 405 prize-winners.

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

Left: "The Grey Heron"
The work of one of the first place winners of an Astronomical Telescope: Sarah Ryan, (Age 12), Scoil Bhríde Eglantine, Douglas Road, Cork.

Look out for details of the 2003 Competition, which will be arriving in Munster Primary Schools shortly.



Above: Abbeystrewery N.S., Skibbereen, Co. Cork. Cllr. Paula Desmond, Mayor of Cork County presenting the prizes at the Carrigaline Court Hotel, Carrigaline, Co. Cork. Also present are Mr. Pat Quinlan, Pfizer Ireland Pharmaceuticals; Jim Murphy, Janssen Pharmaceutical Ltd.; Mr. Paul Bourke, Central Fisheries Board; Mr. Bob Cooke, BIM; and Mr. Matt Murphy, Sherkin Island Marine Station.

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Above: Prize winners from Dromagh N.S., Mallow, Co. Cork.

Right: Prize winners from Knockskeagh N.S., Clonakilty, Co. Cork.

Below: Prize winner from St. Michael's G.N.S., Tipperary.



Above: Prize winners from Scoil Ide, Castleisland, Co. Kerry.



Below: Prize winners from Dromindoor N.S., Cahel, Co. Clare.



Photos © Sherkin Island Marine Station

The President's Awards A Challenge to Young People



Photos: © Oscar Merrin

THE President's Award is the National Challenge Award from the President of Ireland to the young people of Ireland between 15 and 25 years of age.

The Purpose of the Award is to encourage young people to set and achieve a demanding challenge for themselves in each of four different areas of activity as follows:-

- Community Involvement**
e.g. helping the Elderly
- Personal Skill** e.g. learning to play a musical instrument
- Physical Recreation**
e.g. swimming
- Venture Activity**
e.g. a four day cycle

Once the challenge under the guidance of a Leader known as the President's Award Leader (PAL) is successfully achieved, the Participant earns an Award, there is no competition with other Participants. Each Participant is striving to achieve his/her personal best.

In each case the challenge agreed between the Participant and the Leader is unique to that Participant.

No one individual has an advantage over another in earning the Award - the basic requirements for each Participant is measured by hours of endeavour and effort to earn an Award. For this reason, the Award has appeal to a wide range of young people coming from different backgrounds.

There are three Awards: BRONZE, SILVER AND GOLD, reflecting different levels of time commitment.

A **Bronze Award** takes 6 to 9 months to complete and the Participant must be at least 15 years of age on entry.

A **Silver Award** takes 12 to 15 months to complete and the Participant must be at least 16 years of age on entry.

The **Gold Award** is a more demanding challenge over approximately two years and the Participant must be 17 years of age on entry.

It is not necessary to undertake the Bronze Award before attempting Silver and similarly it is not necessary to do the Silver Award before attempting the Gold Award.

What is expected of you in each of the four sections?

That depends on the level of Award as follows:

Community Activity:
You select one activity e.g. helping young people. The

minimum requirement is:
One hour per week for 15 weeks (Bronze); 30 weeks (Silver); 60 weeks (Gold)

Personal Skill:
You select one activity e.g. computers. The minimum requirement is:
One hour per week for 26 weeks (Bronze); 39 weeks (Silver); 52 weeks (Gold).

Physical Recreation:
You select one activity e.g. swimming. The minimum requirement is:
One hour per week for 12 weeks (Bronze); 15 weeks (Silver); 18 weeks (Gold).

Venture Section:
You select one activity e.g. foot or cycling expedition. The minimum requirement is:
Foot Expedition
Bronze: 2 days - 25 to 35 km
Silver: 3 days - 50 to 79 km
Gold: 4 days - 80 to 110 km
Cycling expedition
Bronze: 2 days - 100 to 130 km
Silver: 3 days - 190 to 220 km
Gold: 4 days - 300 to 350 km

The Award operates in a wide variety of institutions e.g. Schools, Youth Clubs, Sports Clubs, Adventure Clubs, Universities, Regional Technical Colleges etc..

In each instance, where the Award is operating there is at least one Award Leader assigned. The Award Leader is a person who is familiar with the Award and he or she is the person who agrees the appropriate challenge with the young person.

The Award is also open to individuals who are not members of any organisation - these are termed 'Independent' participants.

Participating in the Award
Participation in the Award commences once the participant has agreed the challenge in writing with an Award Leader. The Award Leader monitors the Participant and verifies that all the activities are completed and then signs the Participant's record book and sends a completion sheet to The President's Award.

Assuming everything is in order the participant is then presented with the Award on a suitable occasion. In general Bronze Awards are presented at local level and Silver at provincial level. The President presents the Gold Awards.

Purpose of the Award

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Gold Award recipient Catherine Sweeney from Wicklow and her award leader Mary Ashall. For her Community Involvement, Catherine became very involved in Christina Noble Children's Foundation and helped raise funds for children in Romania, Mongolia and Vietnam. For her Personal Skills, she learned to speak French and for her Venture, she organised and took part in the trip of a lifetime - a dancing trip to Vietnam.

to encourage a young person to set a demanding challenge of himself/herself and then to persevere with achieving this challenge. The Award challenges young people to examine what they are capable of achieving during a given time period.

The personal qualities that each participant must call upon and develop in order to earn an Award are perseverance and dedication. The Award is a motivational tool that encourages a participant to make a quantum leap in his/her development for the betterment of themselves and others.

Structure Of The Award

The Award was established by the Government in 1985 with the President of Ireland as its patron. A council of 14 members is appointed by the Government to oversee the Award Programme.

The Award is funded jointly by a grant in aid from the Youth and Sport section of the Department of Education and Science together with donations from private sources.

What do I get when I earn an Award?

You get a medal in a very nice presentation box, a certificate signed by the President, a lapel pin and an experience of a lifetime.

What do I do next?

Go for it!

You have one chance to earn a prestigious Award from the President of Ireland and that chance is right now.

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

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