SHERKIN COMMENT

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Ireland's Birds Lost and Gained

Greenshank in Kinish Harbour, Sherkin Island.
Photographer: Robbie Murphy

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Getting Back to Basics

By Matt Murphy

I AM from a generation that in the 1940s and 50s carefully untied the knots in the twine and carefully folded the brown paper for reuse from any parcels that arrived at our house. Jam jars were set aside for return to the shop for a half penny or so as it meant pocket money to buy comics. Indeed the proceeds from a couple of jam jars would gain you admission to the Lido Cinema in Blackpool. Newspapers were used to light the fire and milk was purchased loose at the house door, in supplied jugs, from the milkman who came around with his horse and cart and a couple of large milk churns on board. The jugs were then placed in the pantry, the coldest place in the house, as there was no fridge in those days. Above all, my greatest memory from then is of how little waste went into the bin for the weekly collection. I think the biggest item was the daily ashes from the fire in winter time.

Even though empty jam jars no longer raise the price of a comic and the delivery of milk into jugs is impractical in today's world, the concept of reusing still does hold some merit. For example, look at how easily we have slipped into bringing our own bags with us when we go shopping, when once we expected one to be produced every time we bought something.

These resource-saving days of my childhood and early teens have stayed with me, often to the annoyance of my now grown family. Top of the list of my "crusade" is the waste of electricity. So often I hear people moan about its cost and how bills are so high and yet I know the very same people constantly leave lights on all over the place. When they want a cuppa they fill the electric kettle to the top instead of just boiling sufficient for their needs. And even in cooking, a low burner would keep the pot/pan on the boil equally well. You can see why I can be an annoyance to my family! In my youth there was no such thing as central heating. We did our lessons in the room where the fire was lighting and it never seemed to be cold. When winter came the extra blankets went on the bed with an eiderdown. But then I was young and the cold didn't affect me as much.

Growing up during and after World War II rations still applied, even here in Ireland, so we had no choice but to use all food and be economical with it. The government issued every household with a book of ration coupons, which were used for purchasing many items. Now we are constantly reading that one third of food we purchase is thrown out in households. In these days of economic difficulty for families, if that waste could be reduced by 50% it would help greatly in reducing the food bill. Attitudes need to change about how food is used. Huge resources have been put into producing it and we need to change our mindset when shopping.

The Stop Food Waste campaign (featured in *Sherkin Comment No. 52* – www.stopfoodwaste.ie) is a really worthwhile campaign. It highlight some interesting reasons why we waste food:

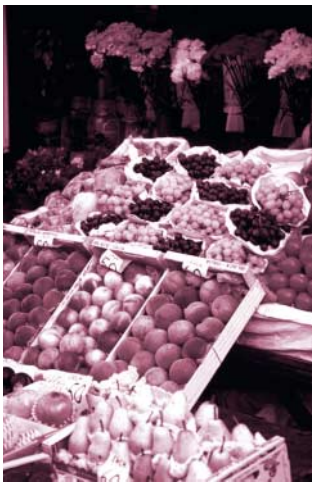
- We do not make a list before shopping.
- We buy more than we need – especially the "buy one get one free" offers
- Buying more perishable food – often as the result of trying to eat more healthily
- We choose food on impulse.
- We have poor storage management – not eating food in date order.
- We prepare too much food in general.
- We don't like the food we buy.
- Our lifestyles affect what we eat or waste.

I find living on an island is a great teacher on waste in general. I have to rely very much on the deep freeze. The problem of course is to make sure to keep a good "turn over" and not fill the bottom quarter of the freezer with forgotten items. Every so often I run down the contents, especially the leftovers from cooking too much.

Running the marine station on a shoe string budget for now over 38 years, has forced me to re-use and hoard out of necessity – at time much to the frustration of family. That is, however, until the need for certain screws, lengths of timber, rope for a boat and then I hear "Da, do you have such and such" – then I straighten up smiling and say "Yes, you'll find it in such a place". If we run short of an item then doing repairs can mean saving a journey to the mainland which takes half a day.

There was a wonderful lady at the National Botanic Garden in Glasnevin, Dublin the late Miss Maura Scanell. From the first time I got to know her I would receive notes about plants typed on the back of some circular she received in the post. This was her normal way of corresponding with everyone, re-using any junk mail she received. Since those early days I have done similarly and frankly have saved a sight of paper. I also reuse envelopes with a special label I printed myself. It is many moons since I have purchase any envelopes or padded envelopes. I also make great savings on toner when using the photocopier by using the reduction mode. At 93% you will not notice the difference against 100%. While 82% and 71% are fine most of the time.

It is amazing what can be recycled. Every home, small business or farm will generate pieces of scrap metal, electronic equipment, electric wire etc.. It accumulates in a short time. Most things can be taken to a recycling centre along with the cardboard, plastic, tins and batteries. Sometimes they can be reused or recycled at home. For me Kerrymaid and Stork 2kg plastic containers are a real gift. I have thousands and thousands of our past 30mm water samples with phytoplankton stored in them in our archives. Compost containers are a godsend for compostible food waste, but that is easier for people who have plenty of space outside.



Often recycling is just a case of being organised and having a place to put the materials until they can go for recycling. Keeping a box for electric bulbs and a long cardboard container for florescent tubes mean you don't give it a second thought. Having a bag especially for old clean rags means they can be given to the St Vincent de Paul or a charity shop, along with good clothes that are not wanted. Since the Prime Time TV programme I am wary of clothes banks and see them as sitting ducks for mass theft. I would much rather bring them directly to the charity.

It is unbelievable how just a few short years ago we sent everything to landfill. Now there has been a dramatic reduction in the number of landfill sites in the country due largely to recycling.

Thinking back, what must have been the first major recycling 'programme' in Ireland began around the 1950s. Then Henry Ford assembled cars in Cork City and all parts came in an assortment of waterproof plywood boxes. When empty they were sold on to an agent who re-sold them the length and breadth of Cork City and County and further afield. The purchaser dismantled them getting sheets of plywood and fine lengths of planed timber. They were used to build holiday homes at seaside resorts, especially in Co. Cork, as well as workshops, hen houses, dog kennels, roofing, kitchen cabinets and shelving. Nearly fifty years on from purchases in the 1960s I have shelves made from boxes in my workshop and they are still in perfect condition.

With a little effort and imagination we should all be able to do more to reduce, reuse and recycle.

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

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Ireland's Birds – Lost and Gained

By Oscar Merne

GORDON D'Arcy's excellent book on Ireland's Lost Birds chronicles the loss of eleven species of birds that were breeding in Ireland in the past and became extinct here. These were the Bittern, Red Kite, White-tailed and Golden Eagles, Marsh Harrier, Osprey, Goshawk, Crane, Capercaillie, Great Auk and Great Spotted Woodpecker. The extinction of the six bird-of-prey species was due largely, if not entirely, to persecution by man, in the mistaken belief that game birds and livestock were being decimated by these predatory "vermin". Unfortunately the Great Auk became extinct globally in the middle of the 19th century, but the other species remained widespread (and in some cases abundant) in Britain or mainland Europe. Three birds-of-prey – Red Kite, White-tailed and Golden Eagles – are currently being reintroduced to Ireland, so far with varying degrees of success. Another – the Great Spotted Woodpecker – has recently established a strong foothold in deciduous woodlands in eastern counties of Ireland. It seems to me that two or three of the remaining species might re-establish breeding populations here, given time, or as a result of new reintroduction programmes.

But in spite of recent improvements in the fortunes of some of the above species there is limited cause for optimism regarding the prospects for quite a number of our other breeding birds. Eighteen of our breeding species have been placed on the Red List of species of high conservation concern in Ireland, while six others are on the Red List as wintering or passage species. 85 others (breeding and wintering species combined) are on the Amber List of species of medium conservation concern. The main causes of declines in the populations of many of these Red and Amber List species are loss and degradation of their habitats from agricultural intensification, land-claim, drainage and pollution of wetlands, overexploitation of marine fish stocks which affects productivity of many of our seabird species, predation by introduced alien species such as Brown Rats and American Mink Adverse factors elsewhere in the range of some species may also contribute to declines here, for example desertification in sub-Saharan Africa may cause elevated mortality in summer migrants such as Sand Martins.

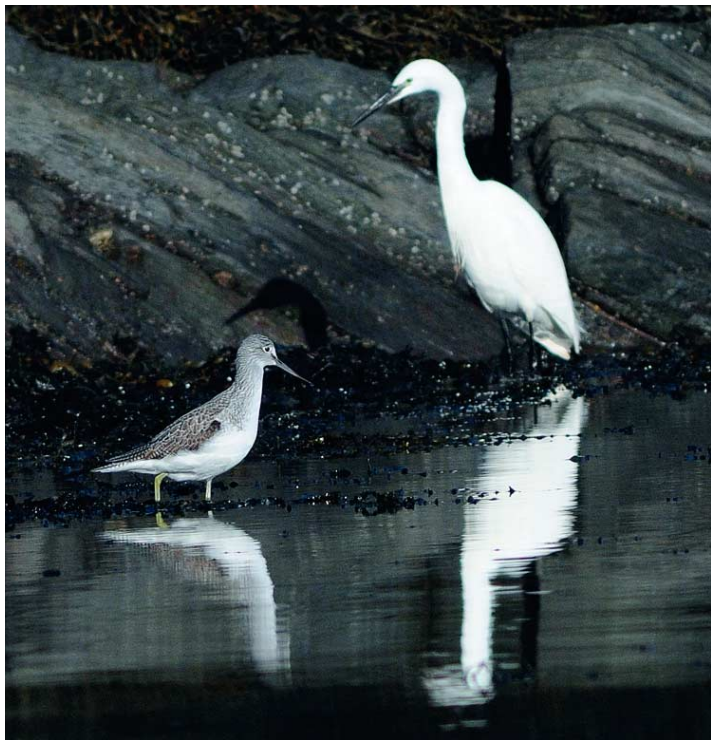
However, not all is doom and gloom. Over the last 350 years or so, about 25 bird species are known to have arrived in Ireland without human intervention, and to have established viable breeding populations here. Perhaps the best known, and, for some, the least welcome of the new colonisers, is the Magpie. The first flock of birds arrived in south Wexford in about 1676, and from there they spread rapidly to all parts of the country by the 20th century – perhaps aided by subsequent immigrations.

The 19th century saw several new species arriving in Ireland and becoming established here. These included the Mistle Thrush, which was first recorded in 1807 and is now a familiar species throughout the country. In 1877 Tufted Ducks were first found breeding in Northern Ireland, and since then the species has spread steadily southwards: I found them breeding in Co. Wexford in 1970. Two other bird species – Stock Dove and Siskin – colonised sometime in the second half of the 19th century, and are now widespread.

Colonisation by new breeding species accelerated in the 20th century. Some of this may be simply an artefact of many more observers finding breeding species that would have been overlooked previously, but some may be due to factors such as climate change encouraging southerly species to expand further north. 20th century colonisers include Pochard (1907), Fulmar (1911), Eider (1912), Collared Dove (1959), Short-eared Owl (1959), Goosander (1969), Black-tailed Godwit (1975), Bearded Tit (1976), Reed Warbler (1979/80), Pied Flycatcher (1985), Whooper Swan (1996), Little Egret (1997), and Mediterranean Gull (1999). Several other species have been recorded as breeding in Ireland in recent decades, but appear not to have become firmly established yet. Examples are Ruddy Duck, Greenshank, Black Tern and Lesser Whitethroat.

Colonisation continues in the new millennium, with Great Skuas establishing a foothold on west coast islands since 2001, and Great Spotted Woodpeckers breeding in at least six eastern counties from 2007 onwards.

Images courtesy of Robbie Murphy



From top left (clockwise): The magpie, the most well-known, but for some the least welcome, of the new colonisers; The Greenshank (left) one of several species recorded as breeding in Ireland in recent decades, and the Little Egret which began colonising Ireland in 1997; The Sand Martin, which has seen a noticeable decline in recent years; The fulmar, an early 20th century colonisers (1911).

Birds, with their ability to fly, are by nature highly mobile, and therefore can colonise new areas more readily than many other animals. The proximity of the island of Ireland to Britain, and its proximity to continental Europe facilitates the spread of species to this country. Few species are deterred by a crossing of the Irish Sea, which is only 20–60 km wide in places: on a clear day it is possible to see land on the other side! Many species are adaptable and opportunistic and can settle into new habitats, even ones that differ significantly from those they are used to. And climate change is allowing some species to extend their range northwards to areas previously uninhabitable to them. In nature, nothing stands still for very long and in a human lifetime an interested observer can see many of the changes outlined in this article.

Oscar Merne retired from Ireland's National Parks & Wildlife Service in January 2004. Before he died in Janaury 2013, Oscar wrote a number of articles for Sherkin Comment to be published in future issues.

Sherkin Island
A Local History

A review by Matt Murphy

IN 1994, Dolly O'Reilly published her first book on *Sherkin Island – A history of the social, cultural and economic life*, which now has been out of print for some time. Having completed a Master's degree in Local History at University College Cork in 2012, Dolly has now produced a major update of this first book, containing much new material.

There has been a dearth of information on the history of our beautiful island. Outside of Dolly's first book most of the references/articles have been about the Franciscan Abbey. Now, with the publication of this major update, a more comprehensive history is available.

In this new book there are twelve chapters, beginning with the Physical Landscape of Sherkin. It is the second largest island in Roaringwater Bay, next to Cape Clear comprising 1,469 acres. The island's rocks are Old Red Sandstone and they are part of the Sherkin Formation. Much of the island is fertile, though the land to the south and west, which rises to the highest point, is rough, hilly and uncultivated. Yet it is this area that supplied the sandstone that was used in building works in Skibbereen, including the town's Roman Catholic church. The island is divided into six townlands. The terrain of each is described and the place names are explained, giving an insight into the natural features of each townland.

The island has a rich history of human settlement and the second chapter "Earliest Inhabitants" examines the artefacts and the history of past societies, from the Wedge Tomb, the oldest known archaeological monument on Sherkin, to the origins of the O'Driscoll clan, which is synonymous with the area.

Chapter three focuses on Marine Matters, including the warfare and piracy of the O'Driscolls against the Waterford merchants who ultimately retaliated and severely damaged the Castle and Friary on Sherkin. We learn also about the importance of Baltimore Harbour as an anchorage, particularly in the late 16th century. At the time, the south west coast was a very rich fishing ground with over 600 Spanish vessels fishing the area.

The built heritage of the island is dominated by the Franciscan Friary and Dún na Long Castle (Fort of Ships), both overlooking Baltimore Harbour. The castle, built by the O'Driscolls, is generally dated to 1460 and is one of a number of their strongholds in the area. The O'Driscoll's suffered most in the great changes of land ownership that took place in the seventeenth century. Following a petition for aid by the Irish in the war against the English, Spanish troops landed on Sherkin in 1601. These were part of the Spanish fleet that arrived in Kinsale. However their stay was short, and by February 1602 both Baltimore and Sherkin Castles were under the command of the British. It was the Spanish Governor Andreas de Aeroy who handed over the castle. On July 26th 1692, a member of the Becher family was appointed Governor of Sherkin. The Bechers family were landlords in this area and Sherkin and Cape Clear island were under their ownership.

The founding of the Franciscan Friary on Sherkin can be traced to the year 1460. In 1440 a papal mandate was given to Finghin O'Driscoll, of the Ross Diocese, who sought permission to found a monastery for Friars Minor in his territory. There is a beautiful conjectural drawing of the Friary (see page 51), which, after being destroyed by a Waterford army in 1537, continued to function to a lesser degree until 1650. The three archaeological excavations, carried out by the Office of Public Works in 1987, 1990 and 1996 centred around the drainage system, the Chapter room, the Cloister walk and the north range of the Friary.

The shipbuilding industry, which operated in the mid-nineteenth century is covered in Chapter Six – Material Culture. At that time, many of the island families, the Nolans, Youngs, O'Driscolls and Norrises owned and skippered their own coastal trading vessels. The shipwrights came from several families of Minihanes. Other industries included rope making, sail making and the manufacture of light ironworks – all done by island families. The Dock area on Sherkin was a hive of industry in the nineteenth century. Ships built there included the *John Field* (1835), *John and Mary*, *Hooker Ellen* and *Beauty of Munster.* It was thought that the last boat to be built there may have been the *John and Mary* and that her master was also named John Field. The slate quarry industry on Sherkin is also described. Lewis's Topographical Dictionary of 1837 refers to it as affording employment to nearly 100 men at that time. The slate was of remarkably good colour and several cargoes were shipped to England where it was in great demand.

Chapter Seven outlines the impact that the Great Famine had on the island and the wider area. An eye-witness account by Fr. Thomas Fenton, Administrator of the islands (Sherkin and Cape), is harrowing. He tells of an able-bodied man going six days with only two meals and on getting a piece of bread on the sixth day, he took it home to his starving father without so much as touching it. The great majority of the females lived on the seaweed and limpets etc.. On both Sherkin and Cape soup kitchens were established before the end of 1847. One may ask why the islanders did not catch fish to eat. Simply, they had no equipment having sold it for food. Even fifteen years after the famine, starvation was on Sherkin. The population of the four larger islands in Roaringwater Bay show the terrible effect the famine had on the islands (see Table 1).

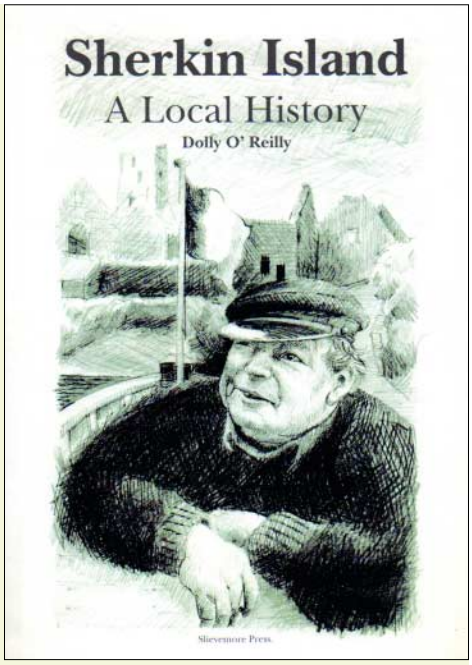
The book goes on to explain the history of farming on the island, as well as the school, demography, infrastructure and services. Anyone who has an interest in Sherkin must read this gem. Dolly O'Reilly has done our beautiful island proud in documenting its history of times past and giving an update on the present. If you were fortunate in having her first book, then read it again and with this new book there is much in each that is not in the other. And to those who have come to Sherkin in the past, the cover drawing of John Willie Nolan, our local ferryman for many years until he died in 1978, will indeed bring back many memories of the trips from Baltimore to Sherkin. He was known far and wide as a colourful character!

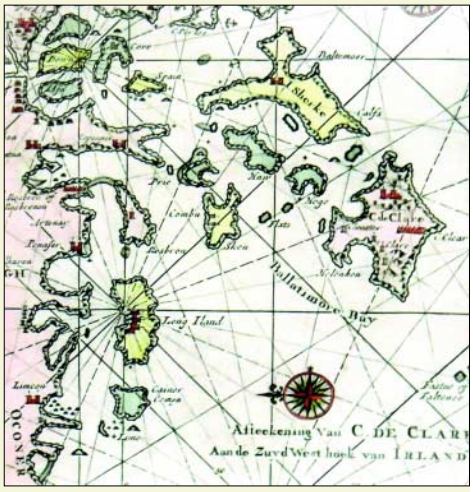
Table 1: Islands Population Decline (1841–2006)

Islands	1841	1851	1901	1951	2006	Decrease
Cape	1052	819	601	257	125	88%
Sherkin	1131	696	350	146	106	90%
Heir	358	288	317	139	24	93%
Long	336	305	199	81	5	98.%

http://irishislands.info/census/graphs/numbers.html [Accessed: 2012/03/14].

Sherkin Island – A Local History by Dolly O'Reilly. Slievemore Press. Published: September 3rd, 2013. Price €12.99. Copies can be ordered directly from dollyoreilly@eircom.net and also available from the following outlets: Islanders Rest Hotel, Sherkin, Islands' Craft Shop, Baltimore (June-End September), Cotter's Shop, Baltimore and in Skibbereen – Pierce Hickey's Newsagents, Cathal Donovan's Bookshop and the Skibbereen Heritage Centre.





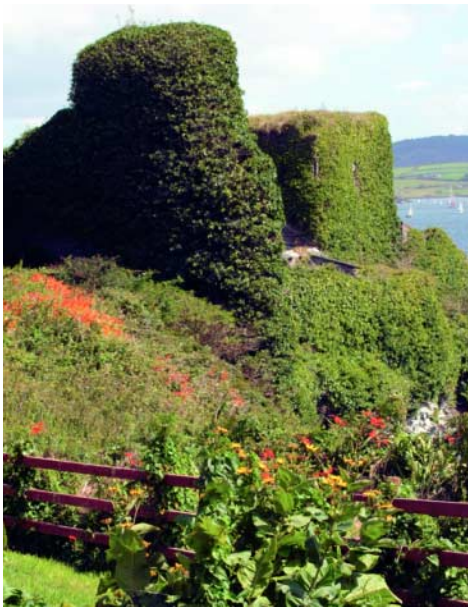
Detail showing islands in Roaringwater Bay, from 17th century Dutch map of Cork Harbour by Gerard Van Keulen, Amsterdam. Courtesy of Special Collections, Boole Library, University College Cork.

Quarry Strand where slate was quarried in the nineteenth century. East side of Horseshoe Harbour. (Photo: Paddy Marshall, Sherkin Island, 2011)

Sherkin Island Wedge tomb. (Photo: Dolly O'Reilly, 2009)

Plants and Old Castles

John Akeroyd explores some historic ruins in the islands of West Cork.



From top: **Dún na Long Castle on Sherkin Island, with Elecampane (*Inula helenium*) in the foreground; Great Mullein *(Verbascum thapsus)* (left) and Burdock *(Arctium minus)* (right); Common Mallow *(Malva sylvestris)*; Dún na Séad Castle in Baltimore.**

OLD BUILDINGS, especially ruins, have long been a happy hunting ground for the botanist seeking weeds. These hardy opportunist plants colonize or persist in places where people cultivate or disturb the ground, abandon land or discard rubbish. Typical of the weeds that grow around ruins are so-called ruderals, from the Latin *ruderalis* ('among rubbish'), including some invasive weeds of cultivation and a group of plants used by the former inhabitants. It's a fair guess that most plants, from medicinal herbs to docks and nettles, associated with such long-term human habitation, have had some sort of use or value. Ruderals have decreased in Ireland over recent decades, due to a cultural and population shift from rural to suburban and a general growth of tidiness.

Fortunately for us botanists (and social, military and architectural historians), Ireland abounds in ruined castles, large and small, tower houses and other fortified dwellings. These date mainly from the violent centuries of invasion and civil and religious wars from the Middle Ages until the end of the 17th century, although the 19th century saw another period of fort and tower building for coastal defence. During surveys by botanists from Sherkin Marine Station of the wild plants of the islands of Roaringwater Bay and Bantry Bay, we've repeatedly found that ruined castles and forts, and other old buildings, support a thriving ruderal flora, greatly contributing to West Cork's wild plant richness.

When botanist Donal Synnott drew up a list of plants associated with castles and abbeys in Ireland, he found, for instance, Hemlock (*Conium maculatum*, extremely poisonous but perhaps once used medicinally) and Common Mallow (*Malva sylvestris)*, a former cough remedy) at 18 of 20 sites he visited. Both grow at Dún na Long castle on Sherkin, and the mallow grows too on the castle mound of Dún na Séad above the harbour at Baltimore. The castle on Sherkin has always been one of our best sites for weeds and old medicinal plants, including a patch of Elecampane (*Inula helenium*), with tall leafy stems and large golden daisy-flowers. For example, Burdock (*Arctium minus*), just a wayside weed to most of us but important in the European medicinal herb trade, is common about old buildings on the islands of Roaringwater Bay. These plants are a living link with the past.

Images courtesy of Robbie Murphy

Top: **O'Driscoll tower house at Rincolisky, Turk Head. *Above:* Parsley *(Petroselinum crispum)***

Perhaps our classic castle plant in West Cork is Alexanders (*Smyrnium olusatrum*). A robust member of the carrot family, with shiny hogweed-like leaves and domed heads of yellow flowers followed by conspicuous black fruits, it probably came here from the Mediterranean with returning medieval Crusaders. It was long grown as a celery-like herb and green vegetable. On the Co. Dublin coast it forms dense stands near the sea, but in West Cork it's more scattered and rarely far from old buildings. In Roaringwater Bay it persists around Dún na Long and the Friary on Sherkin, at Dún na Séad and by the isolated O'Driscoll tower house at Rincolisky on Turk Head, and in Bantry Bay by the small O'Sullivan castle of Reenavanny on Whiddy and formerly at nearby Reenadisert castle, also about the sometime British naval community of Rerrin on Bere Island. An O'Mahony tower house on Castle in Roaringwater Bay lacks Alexanders, but another ancient vegetable, the rare spinach-like Good King Henry (*Chenopodium bonus-henricus*) hangs on nearby.

Botanists have recorded a smaller relation of Alexanders, the flat-leaved wild variant of Parsley (*Petroselinum crispum*) on the walls of Dún na Long since Cork botanist R.A. Phillips noted it in the 1890s. Famous English botanist Oleg Polunin refound it here and on the Friary walls in 1949, and Marine Station botanists have recorded it regularly over some 35 years. Parsley is often associated with old ruins in Ireland. And frequently accompanying Alexanders, Pellitory-of-the-Wall (*Parietaria judaica*) is an old medicinal plant that favours the walls of castles and churches. Like Elecampane, it served to treat bad chests and coughs, useful in the days when island living conditions were cold and damp.

Pellitory-of-the-Wall grows on Dún na Long, the Friary and walls near St Mona's Church on Sherkin, Baltimore's Dún na Séad, and Reenavanny on Whiddy (where Ireland's first woman botanist Ellen Hutchins recorded it back in 1811); and elsewhere on humbler dwellings such as some ruined cottages on East Skeam. Of these sites, Dún na Séad, now beautifully restored as a home, has the richest flora, with both a fragment of native coastal grassland and rich mix of ruderals and arable weeds. Other ruderals here include Great Mullein (*Verbascum thapsus*), Tree Mallow (*Lavatera arborea*) and Calamint (*Calamintha ascendens*), three more old chest and cough remedies!

The most persistent of these plants occurs at just one site in the islands. Ever-observant, in 1811 Ellen Hutchins recorded Dwarf Elder (*Sambucus ebulus*) "in a field below Whiddy castle [Reenavanny]". Isaac Carroll refound this rare Irish medicinal plant in the mid-19th century, a record published in 1883 by the Rev. Thomas Allin, who may himself have seen the plant on Whiddy, in *The Flowering Plants and Ferns of the County Cork*. In 1996 botanists from Sherkin Island Marine Station discovered a large flowering patch of Dwarf Elder at this site. It's still there, and hopefully will be after another two centuries.

John Akeroyd, who has been visiting West Cork since 1986, edited The Wild Plants of Sherkin, Cape Clear and adjacent islands of West Cork *(1996), co-authored its* Supplement *(2011), and edited* The Wild Plants of Bere, Dursey, Whiddy and other islands of Bantry Bay *(2013).*

Coming Together for Henry Ford's 150th Birthday

A public celebration at historic Henry Ford Estate

Courtesy of John F. Martin

Historic cars on display inside the Henry Ford Estate garage.

Courtesy of the Henry Ford Estate

Front of the Residence at the Estate.

Courtesy of John F. Martin

In the Living Room of the Estate.

"Coming together is a beginning; keeping together is progress; working together is success."

ONE of Henry Ford's most famous quotes sets the theme for the celebration of the summer as more than 3,000 people from the community came together to commemorate the sesquicentennial of this American icon.

Coming Together: A Celebration of Henry Ford's 150th Birthday took place July 27 at Henry and Clara Ford's historic home – Henry Ford Estate-Fair Lane in Dearborn, Michigan (U.S.A.).

The day-long party featured live music reminiscent of Henry and Clara's interest in preserving traditional American genre, a special Farmer's Market reminding us of Henry's keen interest in agriculture, and a display of influential Ford automobiles highlighting outstanding innovations from Henry's career – including a rare 1903 Model A. Other cars on site were fine examples of the Model N, Model T, Model A, the V8, a 1942 Ford GP Jeep and a Fordson Tractor.

Mr. Ford would have been proud to see people dancing on the Estate terrace. The couples were contra dancing, square dancing, doing the quadrille, the waltz and more.

"Henry and Clara loved to cut a rug and The Olde Michigan Ruffwater Stringband is the perfect band to set the tone at this grand celebration," said Mark Heppner, Vice President for Historic Resources at Henry Ford Estate and Edsel & Eleanor Ford House (in Grosse Pointe Shores, Michigan). Specializing in the music of the Ford Orchestra, made popular from 1926 to 1943, Ruffwater played traditional dance music while guests put on their dancing shoes and joined in. If not sure of the steps, demonstrators were there to teach guests popular early 20th century dance moves. There were also musicians performing more casual listening music in the Early Rose Garden.

Party goers toured the beautiful gardens and relaxed on the riverfront grounds. Guests went on guided walks that highlighted Henry Ford's interests in bird conservation, ecological restoration, and other related interpretive elements. Thousands also got a glimpse into the Fords' 56-room home, which has been closed to the public since 2010.

The Estate – built in 1915 and listed as a United States Historic Landmark – will be restored, reimagined and positioned to reach 21st Century visitors with new experiences. One of the highlights of the Coming Together celebration was the opportunity for the public to tour the Fords' home before the work begins.

Historical Background

Henry Ford Estate was originally named "Fair Lane" by the Fords after the road on which Henry Ford's father, William Ford, was born in County Cork, Ireland. The Fords travelled to southwest Ireland in the summer of 1912 for business and pleasure purposes, and visited Cork, Bandon, and Clonakilty, as well as France and England. This 1912 trip is thought to have initiated the Fords' interest in tracing Mr. Ford's ancestral roots in Ireland and Mrs. Ford's in England.

Henry and Clara Ford moved into their Fair Lane residence in Dearborn, Michigan in early 1916, with their only son, Edsel Ford, and resided there until their deaths in 1947 and 1950, respectively. Edsel Ford resided at Fair Lane until his marriage to Eleanor Clay in August 1916.

Fair Lane draws primary historical significance from its association with Henry Ford – whose affordable, mass-produced cars and high pay for low-skilled work catalyzed the transformation of the U.S. from a rural to an urban society. Interestingly, Fair Lane's principal architectural and cultural significance emanates from its original 1,300-acre historic landscape, designed by eminent landscape architect Jens Jensen. Jensen was a leader in the Midwestern conservation movement, which appealed to Ford. By the time he built Fair Lane, Ford was already questioning the environmental impact of industrialization, taking up conservation causes and frequently escaping into "nature." While the Fords preferred a "compromise" on Fair Lane's built architecture-revising the original prairie-school mansion design with a baronial overlay-the Jensen landscape was built as a harmonious, integrated, and beautiful whole. Jensen transformed the once flat farmland into a panorama of flowering trees, sweeping lawns, elegant gardens, and naturalistic cascades.

Courtesy of John F. Martin

Historical marker describing the site as a National Historic Landmark.

Courtesy of John F. Martin

Riverside of the Henry Ford Estate.

Jens Jensen is widely recognized as a preeminent practitioner of the Prairie Style of landscape architecture, having had enormous influence on the parks of Chicago and many Midwestern residences in the late 19th and early 20th centuries. Henry Ford Estate-Fair Lane is one of a handful of the many large estates designed by Jensen from the late 1890s until his retirement in 1934 that survives largely intact. Of those that do survive, it is the earliest and best example of his maturing style, and one of the most complex designs of his entire career.

Today, more than 70 acres remain of the Jensen designed landscape at Fair Lane, which encompasses woodlands, a great meadow, a hidden lake, seven gardens, and a naturalistic cascade on the Rouge River that camouflages a hydroelectric dam. Many of the flower gardens have been restored in recent years including the Early Rose Garden, Cutting Garden, Blue Garden, and Trail Garden.

Plans for the Future

In addition to remembering Ford on his 150th year, the celebration on July 27 marked the official transfer of the Estate from the University of Michigan to a newly formed not-for-profit education organization. This transfer of 17 acres of the original Fair Lane property will facilitate major restoration of buildings, grounds, and gardens.

Henry and Clara Fords' great grandsons William Clay Ford, Jr. and Edsel Ford II accepted the keys to the Estate from the University of Michigan-Dearborn Chancellor Daniel Little. "Today marks the beginning of a beautiful journey for my great-grandparents' home, a journey that also produces a valuable collaboration between the Estate and the University of Michigan-Dearborn," said Edsel Ford II. "Today our plan begins for building a new experience, telling stories and operating the Estate."

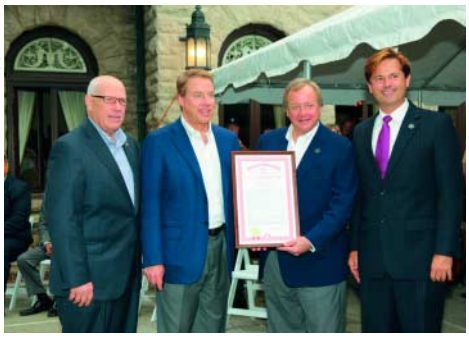
Ford Motor Co. Executive Chairman William Clay Ford Jr., Edsel's cousin, says his great-grandparents would have been pleased to see so many walking on the Estate with an interest in culture, public transportation, home craftsmanship and agriculture. "The people here are excited. I know my great-grandparents would feel the same," Ford said. "It's a chance to make this house a home again. We're going to take the world-class estate and bring it back to the way my great-grandparents had it and use it how they did and how they'd want us to use it – as a place for education and innovation."

Courtesy of the Henry Ford Estate

View of the Great Meadow from the Residence.

Courtesy of the Henry Ford Estate

Jens Jensen's designed cascade on the Rouge River which camouflages Henry Ford's hydroelectric dam.



Courtesy of John F. Martin

Courtesy of John F. Martin

"We are thrilled so many in the community joined us at the Estate for a day of great food, good music, magical memories, the excitement of 'being there' as the Estate begins its new journey," said Kathleen Mullins, president of the Historic Ford Estates (Henry Ford Estate and the Edsel & Eleanor Ford House). "So many were there to recognize and celebrate the many contributions of Henry and Clara…from cars to music to dancing to the bounty of farm fields."

For more information about the Henry Ford Estate and its plans for the future, see: www.henryfordestate.org

Authors: Staff of the Henry Ford Estate and Edsel & Eleanor Ford House

Courtesy of John F. Martin

Top left: **Bill Ford Jr. and Edsel Ford II (centre) receiving a Senate Resolution designating July 30, 2013 as "Henry Ford Day" in the State of Michigan.**
Top right: **Birthday cake designed by the Henry Ford Community College Culinary Arts Program.**
Right: **Event participants enjoying the traditional dance instructions.**
Below: **View of the Blue Garden at the Estate earlier in the spring.**

Courtesy of the Henry Ford Estate

SUNFISHES

(Family: Molidae) in Irish & North-East Atlantic Waters

By Declan T. Quigley

SUNFISHES belong to a small family (*Molidae*) of marine fishes currently represented by 3 genera and 4 species. However, recent genetic work suggests that there may be another clade of *Mola* spp. in Japanese waters. Three species have been recorded from the North-East Atlantic, Ocean Sunfish *Mola mola*, Slender Sunfish *Ranzania laevis* and Sharp-tail Sunfish *Masturus lanceolatus*. However, only two of these have been reported from Irish and NW European waters to date: *M. mola* and *R. laevis*. For many years the Southern Sunfish *Mola ramsayi* was only known from the southern hemisphere but has recently been reported in the northern hemisphere, albeit not from the NE Atlantic.

Sunfishes characteristically have two fused parrot-like teeth in the jaws, no lateral line, no swim bladder, no spines in the dorsal or anal fins, and no pelvic or caudal fins. Noted for their truncated anatomy, the caudal area is reduced to a leathery flap called a 'clavus' which is formed by modified elements of the dorsal and anal fins. The latter fins provide the sunfish's major locomotory thrust. Sunfishes derive their common name from their frequently observed habit of 'basking' at the sea surface.

Ocean Sunfish (*Mola mola*)

Despite its status as the world's heaviest bony fish (the largest authenticated specimen weighed 2.3 tonnes and measured 2.7m in length), along with its circumglobal distribution in temperate and tropical seas, relatively little is known about the biology and ecology of the Ocean Sunfish. In the Western Atlantic it has been recorded from Newfoundland southwards to Argentina and in the Eastern Atlantic from northern Norway and Iceland southwards via the Mediterranean to South Africa.

Although *M. mola* is regarded as a relatively common summer time visitor in Irish and NW European waters, it is generally considered rare in the North Sea and Irish Sea. However, recent studies have shown that the species regularly occurs in the western English Channel. At least 242 specimens have been recorded from Irish waters since 1689; the vast majority (69%) over the last two decades (Figure 1), particularly during July, August and September (Figure 2), and mainly from the SE, SW and W coasts (Table 1). A significant number of specimens were recorded during by-catch surveys associated with the development of the offshore pelagic albacore tuna (*Thunnus alalunga*) fishery during the early 1990s and during jellyfish surveys in the Irish and Celtic Seas during the mid-2000s (Table 2). Although almost 95% of Irish sunfish were recorded either at or near the surface, recent tagging studies in the North Atlantic have shown that the species actively migrates diurnally between considerable depths (0–500m) and seasonally over considerable distances (1819km over 92 days), most likely in response to thermo-regulation, food searching, predator avoidance and seasonal ocean temperatures.

The Ocean Sunfish is considered to be the most fecund of all fish species; a 137cm female contained an estimated 300 million eggs. Although little is known about its growth rate in the wild, a captive individual at Monterey Bay Aquarium (California) gained 373kg in just 15 months (0.82kg/day). Indeed, for a 0.25cm larva to grow to a 3m adult requires an increase in mass of 60 million times. The largest specimens appear to occur in offshore oceanic waters, whereas smaller fish are usually encountered in coastal waters. Although relatively few of the Irish specimens were critically examined, the average size was 130cm and 111kg (Table 3). One of the largest specimens ever recorded (c.3.6m TL), was observed and photographed by SCUBA divers off the Maharees, Brandon Bay, Co Kerry during September 2003.

Although *M. mola* has long been perceived as an obligate predator of pelagic gelatinous zooplankton (e.g. jellyfish), a recent isotopic study suggested that juveniles may have a more omnivorous diet. Indeed, adult sunfish are known to consume a wide range of prey, including some benthic organisms (e.g. fish, crustaceans, ophiuroids, molluscs, hydroids and algae). It is interesting to note that several specimens have been captured on rod & line, which supports the contention that the species, including both juveniles and adults, are active and opportunistic predators; 9 specimens weighing between 9kg and 172kg have been captured on rod & line in Irish waters. The current UK rod & line shore and boat records weighed 48.9kg (off Saundersfoot, Wales, 1976) and 22.3kg (Fisherman's Cove, Cornwall, 1976) respectively. The Catalina Island Museum (California) displays a photo of the famous novelist and big-game angler Zane Grey with a 1000kg *Mola* which he caught in Catalina waters during 1926.

Ocean Sunfish are known to be predated upon by sealions, killer whales, blue sharks and white sharks. The remains of *M. mola* were found in the stomach of a 5.12m adult female killer whale stranded at Doohoma, Co Mayo during October 2010. *M. mola* is frequently infested by a wide range of parasites; at least 54 species have been identified.

Archaeological evidence dated to 5704 B.C. (7717 years ago) indicated that *M. mola* was exploited by Native Americans along the southern coast of California. Although sunfish are not generally targeted by commercial fishing vessels, they are regarded as a delicacy in Japan and Taiwan; a total of 556 tonnes was landed by Taiwanese vessels during 2011. However, there is increasing concern about the impact of high bycatch levels observed in many pelagic fisheries. For example, during the early 1990s, *M. mola* accounted for 70–93% of the total fish catch taken by Spanish drift-net fisheries in the Mediterranean; over 30% of the Irish records were captured in surface drift nets.

Slender Sunfish (*Ranzania laevis*)

The Slender Sunfish is found throughout the world's oceans. Although the species has been reported in the NE Atlantic from Scandinavia southwards to Senegal and Sierra Leone, including the Mediterranean, it is generally regarded as very rare in NW European waters. Indeed, the species has only been reliably recorded on 6 occasions from Irish inshore waters (depths <200m) and there are only about 15 records from UK waters. However, during September 2000, about 200–300 specimens were captured by French tuna drift-netters in the Bay of Biscay and Celtic Sea which suggests that the species may occur more frequently in offshore waters. *R. laevis* is the smallest species of sunfish, reaching a maximum length of c.1m.

Sharptail Sunfish (*Masturus lanceolatus*)

The Sharptail Sunfish is also found throughout the world's oceans. However, apart from a few isolated records from the tropical NE Atlantic (Azores, Canaries & Senegal), the species appears to be restricted to the Western Atlantic where it ranges from North Carolina southwards to SE Brazil. The species is easily identified by its unusually pointed tail which becomes increasingly prominent as the fish grows. *M. lanceolatus* attains similar maximum dimensions as *M. mola*.

Southern Sunfish (*Mola ramsayi*)

For many years the Southern Sunfish was only known from the southern hemisphere but has recently been recorded from the northern hemisphere off SE India (Chennai), Persian Gulf (UAE) and Sea of Oman. The species is superficially very similar in appearance to *M. mola* and attains a similar maximum size.

Since *M. ramsayi* and *M. lanceolatus* can easily be confused with *M. mola* in the field, it is possible that both of the former species may occur, at least occasionally, in NW European waters, particularly if oceanic water temperatures continue to increase, and all specimens should be critically examined.

Photo courtesy of Mike Johnson

Ocean Sunfish *Mola mola*

Photo courtesy of Dr. Kwang-Tsao Shao, Taiwan

Sharptail Sunfish *Masturus lanceolatus*

Photo courtesy of Declan Quigley

Slender Sunfish *Ranzania laevis*

Photo courtesy of Dr Leah Bound, New Zealand

Southern Sunfish *Mola ramsayi*

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Figure 1. Number of *M. mola* recorded from Irish waters (1689-2009) N=240

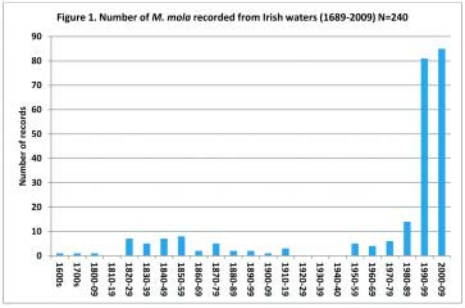


Figure 2. % Monthly frequency distribution of *Mola mola* from Irish waters (1689-2013)

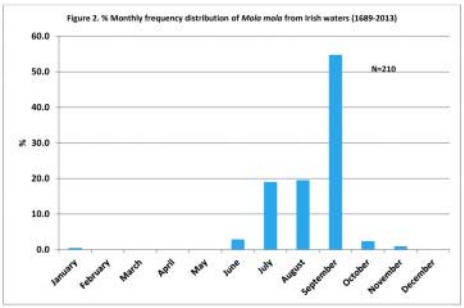


Table 1. Regional distribution of Irish *Mola mola* records

Maritime Country/Area	Number	%	Region
Irish Sea -Celtic Sea	70	28.9	SE
SW Ireland	57	23.6	SW
Cork	24	9.9	S
Kerry	14	5.8	SW
Clare	13	5.4	W
Galway	12	5.0	W
Mayo	11	4.5	W
Antrim	10	4.1	NE
Donegal	9	3.7	NW
Wexford	6	2.5	SE
Dublin	5	2.1	E
Derry	4	1.7	NE
Sligo	3	1.2	W
Wicklow	1	0.4	E
Irish Sea	1	0.4	E
Ireland (unspecified location)	1	0.4	N/A
Waterford	1	0.4	SE
Totals	**242**	**100.0**	

Table 2. Capture methods for *Mola mola*

Method	Number	%
Sighted	115	53.7
Tuna Drift Net	57	26.6
Salmon Drift Net	10	4.7
Rod & Line	9	4.2
Stranded	8	3.7
Gaffed	6	2.8
Demersal Trawl	4	1.9
By Hand	1	0.5
Tagged	2	0.9
Midwater Trawl	1	0.5
Shot	1	0.5
Totals	**214**	**100.0**

Table 3. Dimensions of *Mola mola* recorded from Irish waters

Size	Total Length (cm)	Dorsal-Anal Fin Height (cm)	Weight (kg)
Max	360.0	365.7	1016.0
Min	55.9	67.5	8.4
Mean	130.0	173.8	110.9
SD	68.9	80.6	213.3
N	28	15	23

Oscar Merne – A Personal Story

By Cian Merne

MY late father, Oscar Merne, passed away after a long illness in January of this year. He had been a regular contributor to *Sherkin Comment* for many years so I was delighted when I was asked to pen a few words about him.

My father's interest in wildlife went right back to his early childhood. I remember him telling me that at the age of five he was aware of the many different species of birds that visited the family garden and that he was eager to learn more about them. In his teenage years he trained as a ringer under the late Major Ruttledge and gained valuable experience on the Great Saltee ringing station during the late 50's and early 60's. His professional career as an ornithologist began in 1969 when he was appointed as the first warden of the newly created Wexford Wildfowl Reserve on the North Slobs which was coincidentally the year I was born and where I spent much of my early childhood.

I have many happy memories of this time although being brought along on Greenland white-fronted goose counts did have its drawbacks. Having to sit still in the back seat of a VW Beetle for hours on end to avoid shaking the car while a window-mounted telescope was used to count geese certainly tried the patience of a young child. As well as living in close proximity to huge numbers of wild birds we also often found ourselves looking after the sick and wounded. I remember a razorbill living in our bath for several weeks and a gannet in the garden shed. It was not unusual to have a barn owl perched on the top shelf in the hot press or a young hare making a mess in the sitting room. We even kept an injured bat in a shoebox for a few days until it could be released back into the wild. During much of this period, as well as the day-to-day duties of a warden, Dad was involved in establishing bird monitoring programmes that revealed a great wealth of waterfowl and seabird populations previously undocumented and these formed the basis for many future conservation efforts.

Throughout the 70's and 80's a highlight of my year was our annual week-long trip to Great Saltee Island every June to ring seabirds. While Dad and the other ringers would spend every day ringing auks, gannets, fulmars, shags etc. by the thousands, my two younger sisters and I would have the run of the Island and occasionally assist with ringing. On hindsight, allowing three young children to wander unsupervised all day long on a rugged off-shore island seems somewhat reckless, but those were different times and we never came to any harm other than a few nettle stings. In more recent years my girlfriend (now wife) and I were able to accompany Dad on several trips to Great Saltee to mist-net autumn migrants, which he continued to do even after he was diagnosed with cancer. Mist-netting was also a regular activity in his own back garden.

In 1978 we moved to Bray, Co Wicklow, following Dad's promotion, and he became increasingly deskbound due to the huge amount of administrative work precipitated by the new Wildlife Act of 1976 and the impending EU Birds Directive. He carried out a huge amount of the groundwork required to establish many of our SAC's and SPA's. Despite the mountains of paperwork, he always managed to make time for extensive fieldwork activities, including visits to many of our offshore islands. For many years, even after retirement from the NPWS in 2004, he continued to carry out shorebird census work along the east coast and was heavily involved with the breeding tern projects on Rockabill Island and in Dublin Port. He was also very active on all of the Bird Atlas projects and was able to complete a vast amount of validation work for the upcoming 2007–11 Atlas before succumbing to his illness.

He also managed to write several books and publish over 275 papers, articles and reports during his career and was a regular contributor to Birdwatch Ireland's many bird surveys throughout both his working life and retirement. He was instrumental in setting up the Irish Wetland Bird Survey (IWEBS) that continues to provide vital data on the state of our wild shorebirds, thanks to the many volunteers who take part annually.

Looking back, even our childhood family holidays had a wildlife aspect to them. Camping trips in France invariably found us watching lammergeyer's breaking bones in the high Pyrenees or flamingos feeding in the salt pans of the Camargue or some other wonder of the natural world. Long after my sisters and I had stopped going on family holidays, our parents continued their travels and with no children to hinder them, were able to travel even further afield. Dad managed to visit many parts of every continent and it was always his undiminished enthusiasm for wildlife that drew him to those far-flung destinations. Highlights included the Galapagos Islands, Antarctica and the South Seas. I once accompanied my parents on an African safari in Kenya and while everyone else would be focused on the elephants, Cape buffalo or lions, Dad would often be seen looking in the opposite direction at a bateleur eagle, a glossy starling or a ground hornbill.

Quite often it's only when someone is no longer with us that we begin to fully appreciate what they achieved during their life and this is certainly true with my father. It was only when I read the many obituaries written by colleagues and friends from the birding world that the extent of his efforts to preserve our natural heritage became apparent. There have been many tributes paid to him since his passing, recognising his enormous contribution to wildlife conservation. I would just like to add my own personal tribute to him, as a father who gave me an amazing and unique upbringing and a wonderful insight into the natural world around us.

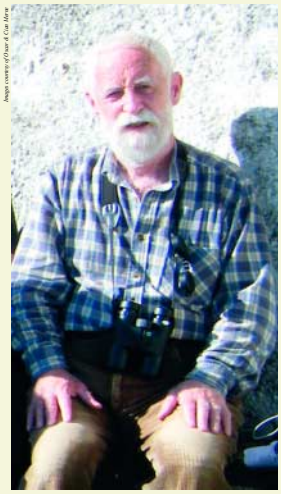
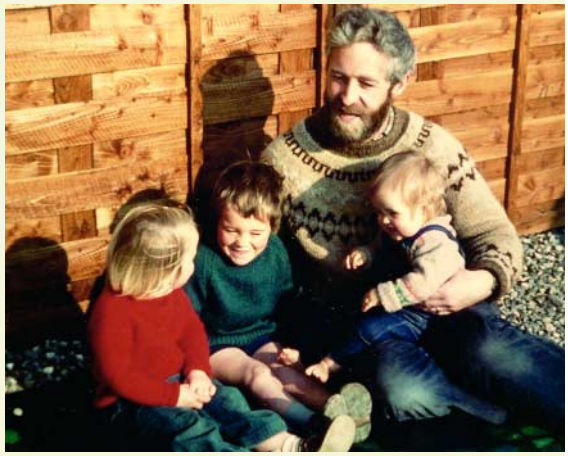


Image courtesy of Oscar & Cian Merne

Oscar in 2009, on a trip with BirdWatch Ireland to the bird observatory on one of the Copeland Islands, Co. Down.

A Gannet colony on the Great Saltee Island, off the Co. Wexford coast.



Taken on the North Slobs in the mid 70's – Dad with myself and my two sisters. *From left to right:* Catherine, Cian, Oscar and Jane.

Cian using his first camera on Great Saltee, about 1976–77. *From left to right:* Catherine, Jane, Margaret (Mum) and Oscar.

The Wexford Wildfowl Reserve on the North Slob where Oscar's professional career as an ornithologist began in 1969 when he was appointed as the first warden.

***Left:* Cormorant with chicks on the Skerries Island. *Right:* African Great White Pelicans and African White-fronted Cormorants – waterbirds of the Senegal River Delta.**

Cian Merne is Senior Technical Officer, School of Mechanical & Manufacturing Engineering, Dublin City University.

The Irish Group Water Scheme Sector

Images courtesy of Brian Mac Domhnaill

Lettergesh/Mullaghgloss GWS (group water scheme) on the western fringe, near Killary harbour in north Connemara is typical of modern community-owned treatment plants that must meet national and international water quality standards. As with the vast majority of group water schemes, it is universally metered, householders paying for every drop of water they use beyond a 'free allocation' that varies depending on the financial circumstances of the scheme.

By Brian Mac Domhnaill

THOSE of us who grew up in urban areas and have always had the convenience of water on tap sometimes forget that a piped water supply was a luxury enjoyed by very few in rural Ireland until relatively recent times.

With the advent of rural electrification and the availability of agricultural grants for developing boreholes, a minority of stronger farmers were in a position to pump water from the early 1950s, but even then the farmer's priority was the byre rather than the home.

For woman and children, drawing buckets of water from the well or from a hand-pump was an unavoidable daily chore. This, and the absence of basic sanitation facilities, encouraged young women to abandon rural Ireland in droves for the comparative comfort of towns and cities in the mid 20th century. And who could blame them?

Small wonder then that it was the Irish Countrywomen's Association (ICA) that would lead the early campaign to bring piped water into rural homes. Despite evidence in the late 1950s that some 90% of such homes were still unconnected to a water supply, government had other priorities. In fact, it was only with the early development of a tourism industry that the Cabinet was convinced, not on social grounds, but because tourism would require the availability of piped water in rural as well as urban areas.

When they met at Termonfeckin, County Louth in 1961, the ICA had the support of Neil Blayney (as Environment Minister) and his government. Under a new strategy, those rural areas that could not be connected to regional public water mains were given the option of building a group water scheme (GWS), whereby water from a single source could be piped to two or more homes through a common network. The construction of such schemes would be funded via local contributions and through pooling the State grants then available for individual wells.

The GWS model had been developed in West Wicklow some years earlier, through the enterprise and energy of a priest (and qualified engineer), Fr Joe Collins. Using local direct labour and with financial and technical assistance from the Department and from the local authority, he established Ireland's first GWS at Oldcourt near Blessington and by the close of the 1950s had piped water flowing throughout the parish of Kilbride.

The early development of the GWS movement was largely confined to the groundwater zones of Leinster and Munster, but early surface water schemes also emerged along the Blackstairs mountains and in a few other pockets.

Organised by local committees who gathered the local contributions and co-ordinated the physical construction (with a huge input from direct labour), the networks began to spread across rural Ireland, but unforeseen obstacles emerged.

Amongst these, the National Farmers Association (NFA) campaigned against the development of schemes on the grounds that communal water supplies would put pressure on the rates. The ICA's response to this thinking was to launch a counter-offensive, encouraging young women not to marry a farmer unless he was prepared to bring piped water and electricity to the house as well as to the byre!

Another unforeseen challenge emerged when GWS members were reluctant to turn off taps for fear that they'd lose the Godsend that was piped water. The late John Flanagan recalled that while installing taps on a newly-erected scheme in Tullyallen, near Drogheda, in 1963, a Department official pulled up to inform him that only push taps could be used, as a Cork scheme had gone dry when members wouldn't turn off their taps.

As a direct result of NFA opposition and a general lack of money in rural areas, the construction of group schemes advanced slowly through the 1960s, but with the advent of entry to the EEC and the increasing demand for improved hygiene standards in agricultural production, the demand for piped water rapidly accelerated from the early 1970s.

Two successive warm summers and drought conditions in 1975 and 1976 convinced rural communities in the drumlin region and across the West that the day of the bucket was indeed past.

Farmer organisations and dairy co-operatives were now to the fore in promoting and facilitating the construction of group schemes that would source their water from dependable lakes, store it in reservoirs and distribute it by gravity to members' homes and farms.

From the outset, the task of group schemes was to provide water to their members and little or no consideration was given to the quality of the water being supplied, other than the original assessment by Department engineers that particular sources were suitable. In fairness, in the period when most schemes started, their sources were clean, if not always pristine.

Fr Collins, who established the first community-owned group water schemes in West Wicklow in the late 1950s. His example provided the model that would be adopted in the early 1960s to bring piped potable water to hundreds of thousands of homes across rural Ireland.

The intensification of agricultural production and associated industries following entry to the EEC meant that there was an upsurge of money into the rural economy. With water on tap, rural homes added toilets and bathrooms, in most cases relying on individual wastewater treatment systems (septic tanks) to deal with whatever came out of the pipe.

Intensive grassland production required an unprecedented input of organic and chemical fertilisers. New, bigger and better machinery meant that formerly 'unprofitable land', such as wetlands, could be made profitable and EEC grants poured in to turn fourth grade land into third grade land.

With all of the social and economic changes of the period, something had to give and as the 1970s rolled into the 80s, it was clear that our raw water sources (and especially our lakes and rivers) were under enormous pressure from organic and inorganic contaminants.

Group schemes were simply not equipped to deal with this new scenario. Many of the original committees had dissolved once the scheme was constructed and the work of servicing pumps and repairing leaks was left to a handful of local volunteers and more often than not to a single individual. Organised as trusteeships, there was no effective management structure and no involvement from the wider community.

Where treatment existed at all, it was simple disinfection using chlorine, although a small number of schemes also had sand filtration. There was no training for those who operated these systems and it wasn't unheard off for the chlorine pumps to be turned off in the face of member complaints about taste and smell.

By the mid 1990s, the entire sector faced

meltdown. A spotlight was shone on the problems faced by group schemes when the poor quality of water supplied by Ballycroy GWS in County Mayo became the subject of a debate in Dáil Éireann and a subsequent case taken before the European Court of Justice.

Besides trying to manage and maintain an extensive piped network over boggy terrain, the hard pressed committee of Ballycroy GWS had to deal with the consequences of intensive sheep grazing on the mountains above their lake source, including serious faecal pollution. Their existing treatment system was totally inadequate to make this water safe for human consumption.

Fast forward 20 years and Ballycroy is today one of the first group water schemes in Ireland to be awarded ISO certification for quality. Its transformation is part of a wider story that has seen the GWS sector – formerly the Cinderella of drinking water services – emerge as an example of all that is best in community-owned and community-led enterprise.

The emerging crisis of the mid 1990s seemed unstoppable. With little or no money to invest in badly-needed infrastructure and with harassed committees and operators trying their best to make do with what limited resources they had, there was no coherent strategy to move forward. Indeed, the sector itself had no common or unifying structure, each scheme acting independently of all others.

A decision by the then Environment Minister, Brendan Howlin, to abandon water charging for householders in urban areas provided the catalyst for change. Feeling that the interests of rural communities had been totally ignored in the Minister's announcement, outraged organisers of group schemes across Ireland gathered at mass meetings to demand equal treatment with their urban neighbours in terms of State funding towards domestic water provision.

With the formation of the National Federation of Group Water Schemes (NFGWS) in January 1997, a representative structure was put in place to negotiate with government and to provide co-ordination between group water schemes.

The co-operative structure adopted by the Federation would encourage the re-organisation of individual group schemes as co-operatives and most schemes have since adopted this corporate structure as a 'good fit'.

A Rural Water Programme (RWP) agreed between the NFGWS and the Department in 1998 provided for State funding towards infrastructural investment on group schemes and an annual subsidy towards the day-to-day management of schemes. The programme emphasised the need for training and it established the principle of partnership between the GWS sector, the Department of the Environment, local authorities and the wider rural sector. A National Rural Water Monitoring Committee representative of all these interests was established as an advisory group to the Minister of the day.

A mammoth task lay ahead, as a large majority of group water schemes in this period were found to be in breach of the crucial requirement for drinking water, that is to be free from faecal contamination.

Apart from problems with bacteriological quality, eutrophication had emerged as a massive problem on lake sources in impacted agricultural catchments. Effective filtration would, therefore, require full treatment (i.e. DAF) prior to disinfection.

With more than 700 schemes listed in the case brought to the European Court of Justice in which Ireland Inc. was found guilty of failing to meet its obligations under the Drinking Water Directive, a multi-faceted approach had to be planned and implemented without delay. The European Court agreed to suspend the massive fines imposed on Ireland, but only if there was clear and speedy evidence of change.

The most cost-effective option had to be adopted. Where the costs of an upgrade would be prohibitive as compared to simply linking a scheme to a neighbouring treated public supply, the latter course had to be adopted. This was not a problem for the many schemes in which committees had become dormant, but it meant a huge sacrifice for those active schemes that were being asked to give up on their own raw water source.

This left more than 500 privately-sourced schemes still to be dealt with which between them supplied water to some 80,000 households. For each of these to go through the design and procurement process individually would have taken many years and for smaller schemes with difficult sources (requiring more robust treatment than simple disinfection), the costs would have been unaffordable where complex treatment was required.

Out of these realities, the bundling of schemes within Design, Build and Operate (DBO) projects emerged as the main plan of the upgrade strategy. The concept was simple; a number of group water schemes would combine to approach the market, taking on a single water service provider to design and built a treatment facility and then operate it for a period of 20 years under an Operate and Maintenance (O&M) contract to be agreed with each individual scheme.

In tandem with the evolution of the DBO strategy, the implementation of Rural Water Strategic Plans for individual counties had hinted that a process of amalgamation would greatly benefit the sector, especially in Western counties. The success of the amalgamation process and the agreement of many sub standard schemes to link into public supplies means that today the number of privately sourced schemes has reduced to 376 and the eventual figure will settle at about 350 schemes.

In contrast to the early days of the sector, training is now a critical component of GWS operations, while a revised subsidy programme agreed in 2009 places even greater emphasis on best practice.

The warning notice at Emy Lough, drinking water source of Glaslough/Tyholland GWS in County Monaghan, indicates the serious problem that eutrophication has become, not least because algal blooms demand increased levels of coagulation, generally using alum, and the cost of disposing of sludge rises significantly during blooms.

Images courtesy of Brian Mac Domhnaill

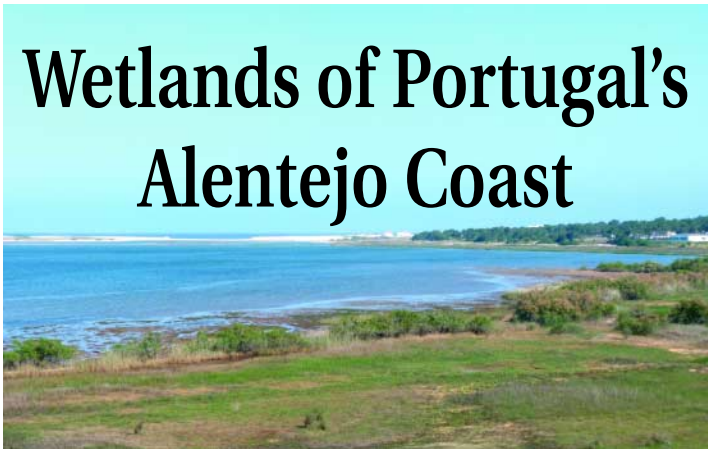
In the 1970s, the GWS sector expanded in lakeland districts of the West and the border counties, where scheme tended to be larger and supplied by gravity from reservoirs. Parke GWS (pictured above) is typical of many such schemes. The proliferation of isolated dwellings with septic tanks and intensive agriculture around the lake source has contributed to nutrification of the source and consequent algal blooms that increase the cost of treatment.

Voluntarism is the bedrock of group water scheme survival. This commitment required is ably demonstrated by 90-year-old Tommy Greaney who carries out daily management of the drinking water supply in his native Glenrevagh, near Corrandulla, County Galway. Tommy travels to and from Galway city every day to check disinfection systems and take measurements of the static water level in the borehole. As with many schemes in the West, Glenrevagh/Cahermorris utilises a disused council borehole. Tommy actually remembers this being drilled in the 1920s.

Because of the dispersed population in rural Ireland, distribution networks are proportionately much longer per household than on public supplies. Pictured above is the laying of a new network on the Mid Roscommon supply.

Brian Mac Domhnaill is Research & Evaluation Officer with the National Federation of Group Water Schemes, 24 Old Cross Square, Monaghan. www.nfgws.ie

Wetlands of Portugal's Alentejo Coast



Santo Andre lagoon.

White stork on nest.

Black-winged stilt.

Carrasqueira.

Slopes above Poco do Barbaroxa.

Images courtesy of Anthony Toole

Cattle surrounded by cattle egrets.

By Anthony Toole

WE spotted our first birds within half-an-hour of leaving Lisbon Airport. Crossing over the Tagus estuary on the 17.2 km Vasco da Gama bridge, the longest in Europe, we gazed over a vast area of mud flats, dotted with waders too distant to identify. On reaching the eastern bank, however, we detoured onto ever narrowing side roads and stopped on a quiet cul-de-sac in the midst of a series of lagoons.

Though some of these were irregular in outline, the rectilinear banks of others proclaimed their artificial origins. They had been scoured out of the saline marshland to create brackish ponds from which the water evaporated to leave a harvest of salt. Now abandoned, they had been reclaimed by Nature.

Common species, such as coot, moorhen and mallard floated over the surface, while black-winged stilts daintily picked their ways across the shallows, occasionally dipping their heads into the water to capture a nourishing morsel. In the surrounding fields, cows grazed contentedly, ignoring the scores of cattle egrets that stood around them, and even perched on their backs.

The fields themselves were aglow with flowers, while the trees were fully verdant, in contrast to those of the lingering winter we had left behind us in England. Even the poppies displayed a more vivid red than we were used to.

Covering some 34,000 hectares, the Tagus estuary is the largest wetland in western Europe. Almost one-third is composed of intertidal mud flats, which house an enormous array of invertebrates, making it one of the most important stop-over sites for migrating birds. Around 50,000 individuals spend their winters here. An area of 14,000 hectares, which includes rivers, salt marshes and agricultural land, comprises a nature reserve, established in 1976. Four years later, it was recognised as a wetland of international importance under the Ramsar Convention, and in 1994, became a Special Protection Area for wild birds under a European Union directive.

Strolling along the road, we stopped to scan the pools and flatlands with binoculars. These pauses yielded sightings of several grey herons, a much rarer purple heron and a pair of marsh harriers. On the muddy banks of a small, tidal river, were two Kentish plovers and a squacco heron. We also caught the first glimpses of the white herons that would become a recurrent feature of our progress over the next five days.

We returned to our transport and drove the short distance to Hortas, a small nature reserve on the shoreline of the estuary. Here dunlin, godwit and grey plovers pecked at the gravel between the fishing boats stranded by the tide.

We adjourned for lunch to the nearby small town of Alcochete, then drove south, and after an hour, turned west at Alcacer and along the southern shore of the Sado estuary. I insisted on stopping to photograph a stork nesting on top of a tall pole. I need not have been so anxious to do so. We saw hundreds of them, on poles, pylons, chimney stacks and occasionally even trees.

This broad, shallow estuary is also a Ramsar site and Special Protection Area for birds. Its waters contain more than forty fish species, while its margins harbour many amphibians and reptiles, including lizards, snakes and terrapins. Pods of bottle-nose dolphins frequent the estuary. Some 40,000 waders, which include avocets, dunlin and godwit spend the winter here.

A sandy track led us through cork trees and eucalypts to another area of salt pans, some quite extensive. The noises of chirping frogs drowned any birdsong. These we traced to a concrete water channel, which was alive with edible frogs, a hybrid of marsh frog and pool frog that shared a common ancestor as far back as the last Ice Age. Though they are a fertile hybrid, they only produce fully viable offspring if a female breeds with a male of one of the parent species.

Colourful bee-eaters flitted among the shrubs, while a black-winged kite and a booted eagle circled overhead. Among the pools, we spotted spoonbills, glossy ibises, little egrets and a small number of flamingos.

A second detour brought us to Carrasqueira, and a unique jumble of wooden jetties to which tiny fishing boats were moored. While carefully picking our way through the unstable-looking labyrinth, we watched redshanks, turnstones and bar-tailed godwits foraging along the shoreline.

We followed the road north along a 15–kilometre sandspit to our night's accommodation at Aqualuz Apartments in the river-mouth holiday resort of Troia. The spit was no more than 500 metres wide at its widest, and consisted of a series of sand hills, held in place by shrubs, conifers and eucalypts. To our east lay the river, and to the west, the Atlantic.

Wasting little time the next morning, we headed south to the coastal lagoon of Santo Andre. During the winter, this fills with fresh water from its rivers and springs, providing a haven for migrants. In the summer, the coastal sand barriers are breached to allow the sea to enter, creating a brackish lagoon, which becomes a breeding site for a different collection of birds. This process, in addition to re-stocking the lagoon with fish, prevents the build-up of algae and the eutrophication this would cause.

From the Monte do Paio Interpretation Centre, at the north-east corner, we followed a sandy track downhill and across a footbridge, then up to a high point overlooking the lagoon. In the water and along the shore were gannets, sanderling, dunlin, grey plovers and great-crested grebes, while in the surrounding fields were white storks, bee eaters, egrets and in a nearby clump of soft rush, a single yellow wagtail.

Farther south, and separated from the beach by tall dunes, we came to Poco do Barbarroxa de Baixo, a tiny pool almost swallowed by reedbeds, where we saw no birds at all. However, the surrounding slopes were a blaze of flowers, most of which I could not put a name to. These were salt-tolerant species and succulents, able to thrive in arid, sandy conditions. There were yellow and white rock roses, red and yellow daisy-like species, tiny white ground-hugging flowers that resembled sandwort, vivid blue bugloss and a pink type of campion. Together they formed a thick carpet of colour covering the sandy slopes.

Though I am far from being a fanatic, I enjoy observing birds, and indeed any kind of wildlife and always feel a thrill when I see an uncommon bird, or one I have not seen before. When I listed the species I had seen during my two days on the Alentejo coast, I counted twenty that were new to me. I was now moving inland toward the contrasting environment of the pseudo-steppe region around Castro Verde, where I could expect to encounter a different set of species to add to my total.

Useful information

I flew from Heathrow to Lisbon with TAP Portugal airline, as a guest of Alentejo Tourism: www.visitalentejo.com

The trip was organised through Sunvil Discovery: www.sunvil.co.uk

Our extremely knowledgeable guide, who knew where to see the birds and how to identify them was Jorge Safara of Birdwatch in Alentejo: www.birdwatchinalentejo.com

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The Environmental Protection Agency's New Air Quality Index for Health

By Kevin Delaney

IN April 2013, the Environmental Protection Agency released the new web-based *Air Quality Index for Health*. The new index incorporates health advice in tandem with near real time air quality information from the National Air Quality Monitoring Network. The result is an easily deciphered colour-coded scheme with four general bands – good, fair, poor, very poor. The general bands are then sub divided into 10 colour coded bands 1–10, with 1 being good and 10 being very poor. An example of the index is presented below.

The release of the web-based index coincides with European Commission's designation of 2013 as the Year of Air.

The new index is a collaborative effort developed in conjunction with teams from the Health Service Executive, Met Éireann and the Department of the Environment, Community and Local Government. The working group, entitled 'Air Quality Health Information Working Group', was formed in 2011. The initial work of the group focused on reviewing existing indices around the world. One of the key outcomes of this process was the need to align the health messages with those in Northern Ireland, to avoid confusion in border regions.

The *Air Quality Index for Health* is based on measurements of five air pollutants, all of which can harm health. These are:

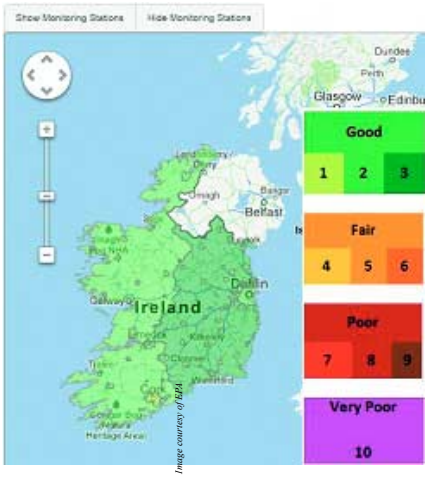
- ozone,
- nitrogen dioxide,
- sulphur dioxide,
- PM2.5 (particles with a diameter < 2.5 µm)
- PM10 (particles with a diameter <10 µm).

The index for each pollutant is calculated separately. The overall *Air Quality Index for Health* is the worst index of the five pollutant indices.

The index is calculated hourly using near real time data from the ambient air network and is then merged with the relevant health advice for that band. The health advice that accompanies the index rating is aimed at both the general public and individuals whom may be susceptible to changes in air quality e.g. adults and children with lung and heart problems. People can use the Air Quality Index for Health to make informed decisions, particularly if suffering from respiratory or cardiovascular problems.

The public can access the latest index rating for Ireland at ww.airquality.epa.ie. Accompanying the colour-coded map is information on

- How to use the *Air Quality Index for Health*,



The public can access the latest index rating for Ireland at www.airquality.epa.ie.

- Health Advice to Accompany the *Air Quality Index for Health* and
- Additional Information on the Short-term Effects of Air Pollution.

Within Ireland there are six Air Quality for Health Index regions:

1 Dublin,
2 Cork,
3 Large Towns (population >15,000),
4 Small Towns (population 5000 – 15000),
5 Rural West and
6 Rural East.

People living in areas close to the border of two regions should check both regions. The ensemble of real time data that goes into the composition of the *Air Quality Index for Health* is based on a selection of monitoring points in each zone. It should be noted that the information is representative of the whole region in general; infrequent, localised sources e.g. an industrial fire, will not be reflected in the index. Likewise, a localised event close to a monitoring site included in the index will lead to a poorer rating for the entire region than may actually be the case.

The index is also available via the twitter channel, *@EPAAirquality*. Members of the public can receive daily tweets on the status of air quality in all six *Air Quality Index for Health* regions. The frequency of tweets increases when the air quality decreases to poor or very poor.

Overall Ireland enjoys relatively clean air, with no exceedances of EU limit values for pollutants. Ireland's position to the west of Europe and the influence of frequent south westerly wind flows are the main reasons for this. The lack of heavy industry and good regulation of manufacturing on the Island mean that contributions from the industrial sector at a regional scale are quite low. However there are challenges to be met.

Within urban areas, contributions from transport particularly in relation to nitrogen dioxide levels are substantial. The problem of poor air quality is not only an urban issue and this is best highlighted in relation to domestic home heating fuel use and levels of PM_{10} and $PM_{2.5}$. While there are no breaches of EU legislative limit values, a number of PM monitoring sites exceeded World Health Organisation limit values. The ban on bituminous coal use in Dublin and other cities and large towns throughout Ireland has had a positive impact on air quality in those areas. A complete ban on the supply of bituminous coal should have a positive impact on air quality in rural areas outside of the current regime.

On a wider European scale, the EC has designated 2013 as "Year of Air" in recognition of the importance of improving air quality in the EU where air pollution causes an estimated 490,000 premature deaths annually.

What next? It's anticipated that a forecast *Air Quality Index for Health* will be in place by late 2013 or early 2014. Development of the forecast is on-going as part of an EPA STRIVE research fellowship in conjunction with Trinity College Dublin. The first step will be to model the concentrations of pollutants included in the index at a number of current monitoring points. The forecast will use meteorological data as an input from Met Éireann yielding a 30-hour forecast. This will form an initial step of a much larger modelling project for Ireland. The aim of the project is to model ambient concentration of air pollutants across much of Ireland, including both urban and rural areas.

Kevin Delaney, Air Quality Specialist, Office of Environmental Assessment, EPA (Environment Protection Agency)
www.epa.ie/air/quality/

The Hedgerows

Leave us the hedgerows, o landowner thrifty
The lovely wild hedges adorning the land
To salvage some inches of soil for your profit
Must they be uprooted by a philistine hand?

The hedgerows in Springtime with little birds nesting
With the dog-rose and mayflower and woodbine are dressed
While sheltering beneath them the pale primrose blossoms
And the shrew and the hedgehog abide there and rest.

How the town-dweller longs for the countryside blooming
And dreams of green meadows and by-ways o'er grown
And summer air's laden with perfume of flowers
Where the songbirds sing loud and the honey bees roam.

When the summer is fading and the harvest is coming
The hedgerows hang heavy with secrets untold
The hips and blackberries gleam rich on the bramble
And the rowan tree shines out all emerald and gold.

Plough your fields, busy farmer; sow the wheat and the grain
By the sweat of your brow shall the needy be fed
But leave us the hedgerows our sad hearts to gladden
Man lives not by bread alone - have you not heard it said?

Kay Harding
September 1980

NGOs and the "American Rule"

The Key to the Success of Environmental Regulation in the United States

By Walter Mugdan

July, 2013[1]

IN 1973 I was in law school at the University of Michigan. I was studying to become part of what was then a completely new field of legal practice – environmental law. My teacher was Joseph Sax, widely regarded as one of the most influential "fathers" of the fledgling field.

My goal upon graduation was to work for the U.S. Environmental Protection Agency, at that time in its infancy, having just opened its doors in 1971. While most in the "environmental movement" hailed the creation of EPA, Professor Sax was skeptical. He pointed to the 85-year long history of government agencies that had been "co-opted" by the very industries they were charged with regulating. The pattern started with the Interstate Commerce Commission, created in 1887 to ensure fair rates and eliminate rate discrimination in the powerful railroad industry. Many commentators would in later years assert that the ICC ended up protecting the railroads more than the consumers. Other regulatory agencies, from local building departments to the federal Atomic Energy Commission, could also be accused of becoming overly solicitous of the concerns of their regulatees. Professor Sax predicted the same fate for the U.S. EPA.

I graduated in 1975 and was fortunate to secure my dream job with EPA's Region 2 office located in New York City. I've been there ever since.

No doubt there is much that EPA has done, or failed to do, in its 42+ years of existence to cause environmentalists disappointment. But, I submit, no fair-minded person would contend that Professor Sax's fears have been realized.

If I am right – if EPA has avoided being co-opted by the industries it regulates – the credit is largely due to the influence of non-governmental organizations. And if NGOs have been responsible for keeping EPA from sliding down that slippery slope, the so-called "American Rule" has been one of the most important elements in their success.

More about the American Rule later … let's start with a brief history of the environmental movement.

The Rise of the Environmental Movement

In the United States – and arguably the world — the start of the modern environmental movement can be traced to the publication, in 1962, of Rachel Carson's *Silent Spring*. The title alluded to a springtime she foresaw in the not-too-distant future when no birds would sing and no insects chirp because they would all have been killed by our profligate use and abuse of industrial and agricultural chemicals.

The book was a clarion call to action against the ubiquitous pollution that had become the hallmark of the Industrial Age. The call came at a time when American society was primed to hear it, a time of progressive zeal and social ferment.

During the early 1960's the civil rights movement led by Dr. Martin Luther King had finally begun to touch America's conscience, and many young people – both black and white – had become engaged in the cause. These young people absorbed Dr. King's message of peaceful protest and civil disobedience as a way to move society forward.

By the mid-1960s America's War in Vietnam was affecting the millions of post World War II "baby boomers" who were subject to the military draft. The increasing death toll in an unpopular war, coupled with television news coverage that brought scenes of carnage into American living rooms, gave rise to the anti-war movement.

Recognition of the vast destructive potential of the nuclear arsenals built up by the U.S., the Soviet Union, and a growing number of other countries spurred the peace movement, which overlapped with the anti-war movement.

The women's liberation and gay rights movements also arose during the 1960s, as changing demographics and economics and social norms contributed to the intense social upheavals that characterized the decade.

And from this hyper-fertile ground of social unrest and clamor for progressive change also sprang up the modern environmental movement. It grew naturally out of the conservation movement, which had started in the middle of the 19th century and reached a major milestone in 1892 with the founding of the Sierra Club by the enormously influential John Muir.

The conservation movement was concerned about

preserving America's great landscapes. One of its first serious battles with government was Muir's unsuccessful fight (1908–1915) to save California's beautiful Hetch Hetchy Valley from being flooded by damming of the Tolumne River. Over the next half century the conservation movement honed its strategies and techniques. By the 1950's, when the Sierra Club came under the direction of the legendary activist David Brower, the tide had begun to turn with successful fights against the Echo Park Dam in Dinosaur National Monument (Utah/Colorado) and, in the early 1960s, against two dams proposed for the Grand Canyon (!). Brower's Sierra Club and other like-minded conservation groups also lobbied vigorously and effectively for passage of important legislation like the Wilderness Act of 1964 and the Endangered Species Preservation Act of 1966.

It was natural for the conservation movement to evolve into the environmental movement, and many of the leaders of the former soon become leaders of the latter. By the second half of the 1960s, Brower's Sierra Club had moved into the forefront of the nascent anti-pollution movement, devoting its prodigious lobbying experience to the effort to secure national legislation to address environmental degradation. A few years later, in 1969, Brower founded Friends of the Earth which quickly became another leading NGO (at first nationally and then internationally).

The message of the environmental movement struck a strong responsive chord as evidenced when Americans celebrated the first Earth Day on April 22, 1970. As one historian later wrote, Earth Day "brought 20 million Americans out into the spring sunshine for peaceful demonstrations in favour of environmental reform."

Success in the Legislature

The first great success of the fledgling environmental movement came with the passage, at the end of 1969, of the National Environmental Policy Act. Known as NEPA, the law imposed what at first glance seemed to be relatively modest obligations on federal government agencies. NEPA required merely that before embarking on "major" federal projects that have the potential for "significant" environmental impacts, an agency must identify those impacts along with possible means of mitigating them. Here was the genesis of the now nearly universal Environmental Impact Statement.

Notably, NEPA did *not* require federal agencies to reject projects with significant adverse impacts, nor did it require the agencies to undertake mitigation steps. It simply required that the decision-maker and the public have the relevant facts. Nevertheless, NEPA soon became the vehicle through which

environmental NGOs blocked or delayed a myriad of ill-conceived government projects, and caused innumerable other projects to be improved through better planning and design. They did so by winning lawsuits challenging the adequacy and completeness of the Environmental Impact Statements for these projects.

Relying on the formidable experience garnered by the century-old conservation movement, environmental activists were successful in securing the passage of an extraordinary number of national, state and even local anti-pollution laws over the ensuing decade. The Clean Air Act of 1970 was the first such law with real regulatory teeth. This was followed in quick succession by the Clean Water Act (1972); Ocean Dumping Act (1972); the Federal Environmental Pesticide Control Act (1972); the Resource Conservation & Recovery Act (1976, regulating both solid and hazardous wastes); and the Toxic Substances Control Act of 1976. The so-called Superfund law of 1980, providing for cleanup of abandoned hazardous waste disposal sites, rounded out what has come to be called the Environmental Decade.

Unquestionably, the environmental NGOs were successful in the legislative arena. But translating well-intentioned laws into effective, on-the-ground improvements would often depend on their ability to succeed in the judicial arena. And there the movement's success was enabled immeasurably by a United States legal doctrine known as the American Rule.

The American Rule

Under the older, long-established English Rule, the losing party in a civil lawsuit has to pay the attorney's fees of the winning party. Most of the world – not just the English – operates under this rule.

By contrast, under the American Rule, each side pays its own attorney's fees, regardless of who wins and who loses (unless otherwise specifically authorized by statute or contract).

The benefits of the English Rule are that it reduces the likelihood of frivolous lawsuits, and it makes whole the winning party whose attorney's fees may be very large.

The benefit of the American Rule is that it encourages recourse to the courts by those of limited means, even when theirs is a case of first impression and/or of uncertain outcome. Wikipedia – that ultimate authority on everything – explains it this way: "The rationale for the American rule is that people should not be discouraged from seeking redress for perceived wrongs in court or from trying to extend coverage of the law. … [S]ociety would suffer if a person was unwilling to pursue a meritorious claim merely because that person would have to pay the defendant's expenses if they lost."

Indeed, American society has benefited greatly from the American Rule, albeit at the expense of making ours the most litigious country on earth. Thanks to the American Rule, all the progressive movements mentioned above, from the civil rights to the environmental movements, have achieved as many advances in the U.S. law courts as they have in the legislatures or the courts of public opinion.

The American Rule means that an environmental David can take on an industrial or governmental Goliath in the judicial arena, provided only that David can pay his own attorney (or persuade his attorney to provide representation *pro bono* – for free).

The American Rule means that some of the most effective and influential environmental NGOs in the U.S. are environmental law offices. Among the oldest and best known of these are the Environmental Defense Fund, the Natural Resources Defense Council, and Earth Justice. Their primary mission is to act as lawyers to the environmental movement, representing in the courts their own members or other environmental NGOs.

NGOs in the Courts

Environmental NGOs have used the courts extensively to influence environmental policy. Their ability to do so stems in large measure from the rules of Administrative Law. This field of law addresses how agencies of the executive branch of government must function, particularly when they perform tasks that are legislative in nature.[2]

Most of the environmental statutes enacted by Congress direct the EPA to promulgate detailed regulations that implement the broad policy objectives laid out in the law. These regulations – which today fill three or four feet of bookshelf space – are functionally indistinguishable from legislation; that is, once promulgated, they have the binding effect of law just as if Congress had passed them. But because these regulations are issued by unelected bureaucrats rather than the elected members of Congress, they are subject to legal challenge by almost any interested party. The challenge will be successful if the plaintiff can prove that the regulation in question is inconsistent with the authorizing statute passed by Congress, or that the agency was "arbitrary and capricious" – *i.e.,* that it had no reasonable basis to issue the regulation.

By mounting such challenges in the courts, environmental NGOs have ensured that EPA does not stray too far from the purposes of Congress as expressed in the statutes, nor get pulled too far in the direction of the very industries being regulated.

It is very common that when EPA issues an important regulation, the agency will promptly be sued by *both* sides – by industry, arguing that the regulation goes too far, and by the environmental NGOs, arguing that it does not go far enough.

If industry were EPA's only legal adversary, then over time it would almost certainly happen that the agency's regulatory orientation would drift in industry's direction – precisely the concern voiced forty years ago by my environmental law professor Joseph Sax. What he did not foresee was that environmental NGOs would act as a sea anchor keeping EPA pointed in more-or-less the right direction … or, to use a different metaphor, that they would serve as a counterweight on EPA's left flank to balance the pull of industry from the right.

NGOs as "Private Attorneys General"

Congress went even further to enable NGOs, as well as individual citizens, to assist in the enforcement of federal environmental laws. Starting with the Clean Air Act in 1970, Congress included innovative "citizen suit" provisions in many environmental statutes. These allow a private citizen to file a lawsuit against any other person or entity for violating the statute. Citizens can also sue EPA for failing to perform a non-discretionary duty — that is, for failing to do what Congress explicitly directed EPA to do.

Of particular importance is the fact that for these kinds of citizen suits Congress has explicitly changed the American Rule so that citizen plaintiffs can recover their attorney's fees and related costs if the lawsuit is successful.

These citizen suit provisions, coupled with the ability of a successful citizen plaintiff to recover attorney's fees, have made it possible for environmental NGOs to act as "private Attorneys General." In the United States the Attorney General, as head of the Department of Justice, is the government's chief lawyer, charged with the responsibility of enforcing the nation's laws. In the case of a citizen suit, it is a private party – rather than a government official – who brings suit to enforce the nation's environmental laws. And the citizen plaintiff does so not to realize personal gain, but rather to benefit the public at large.[3]

Conclusion

Since the earliest days of the modern environmental movement in the United States, environmental NGOs have played pivotal roles in shaping both broad public policy as well as the details of the environmental rules that now fill literally tens of thousands of pages. They have done so not only by generating public support for their positions and lobbying legislatures, but also by resorting on countless occasions to legal action in the courts. Thus they have been able to "balance the scales" when the formidable legal and financial resources of industry are arrayed against the regulatory agencies.

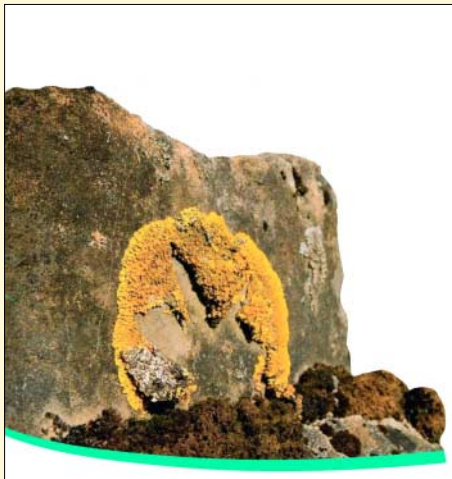
They have also used the courts to hold those agencies' feet to the fire, insisting that their statutory obligations be met. One such action – indeed, one of the most significant environmental lawsuits of the modern environmental era – was a U.S. Supreme Court case named *Massachusetts v. EPA*. A consortium of plaintiffs that included 12 states, 3 cities and 13 NGOs sued to compel EPA to start regulating carbon dioxide as a "pollutant" under the Clean Air Act. In 2007 they won this landmark case about the world's most ubiquitous greenhouse gas. Faced with the unwillingness of the dysfunctional U.S. Congress to take action, the plaintiffs in this case enabled – no, they *required* EPA to address the most important environmental issue of our time: global warming. And in his June, 2013 address on climate change President Obama announced his intention to have EPA carry out that mandate.

Four decades ago Professor Joseph Sax predicted that entrusting environmental protection to a regulatory agency like EPA would prove to be a failure because the agency would inevitably come to be in thrall to the industries it was intended to regulate. But he was wrong … perhaps because he did not reckon with the willingness of environmental NGOs to serve as public watchdogs, nor with the citizen suit provisions and the American Rule that enabled them to use the courts to do so.

[1] Mr. Mugdan currently serves as Director of the Emergency & Remedial Response Division in the Region 2 office of the U.S. Environmental Protection Agency, located in New York City. However, any opinions expressed in this article are his alone, and do not necessarily represent the views of the EPA.

[2] In the U.S., unlike in a parliamentary system, the executive, legislative and judicial branches of government are separate and distinct. Each of the three branches has its designated roles and authorities which are usually jealously guarded. When Congress authorizes agencies like EPA to promulgate extensive, detailed and elaborate regulations, it effectively cedes to the executive branch some of its own legislative powers.

[3] Some NGOs have made a cottage industry out citizen suits. They cull through vast amounts of data routinely gathered by EPA in order to identify and bring suit for violations that were overlooked by the government. This is possible because they can recover their attorneys fees.



Compass jellyfish, *Chrysaora hysoscella* photographed off Sherkin Island.

Stingrays *Dasyatis* sp. aggregating, possibly for breeding, in New Caledonia.

Dugong are extremely shy, but this individual in Vanuatu in the South Pacific, is habituated to snorkellers.

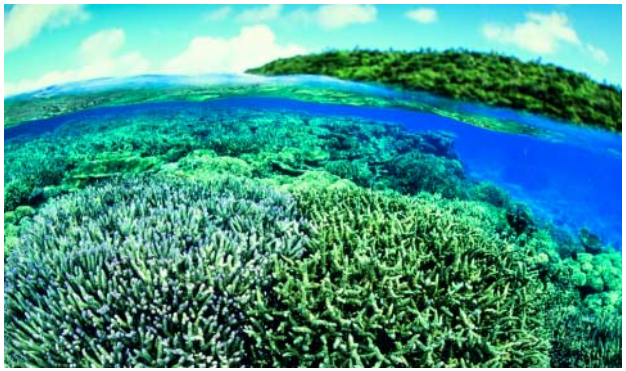
Pacific halfbeaks *Hyporamphus acutus acutus* feeding under the raft of foam coming off the windward reef.

Grey reef shark, *Carcharhinus amblyrhynchos* passes overhead at Beveridge Reef, an oceanic reef between Tonga and the Cook Islands in the South Pacific.

Images courtesy of Pete Atkinson

Crown jellyfish, *Netrostoma setouchianum* in Fiji.

Six miles off Moorea in French Polynesia I found two humpback whales, a hundred melonhead whales, roughtooth dolphins, and, as I soon found out, two large oceanic white tip sharks!



Staghorn coral, *Acropora* sp.

Mask, snorkel and fins = *ADVENTURE!*

By Pete Atkinson

MANY of my happiest times in the ocean have been snorkelling in water less than 4m deep with a camera. The reverie is uninterrupted by concerns about air, safety, tomorrow, a buddy, or even, these days, running out of film. You have a seamless proximity to the weightless delight of being at one with the sea. All the equipment you need is a mask, snorkel and fins, and a wetsuit and weight-belt if the water is cold. The only danger, and it is significant, is shallow water blackout. Take only a couple of deep breaths before you snorkel down; if you hyperventilate beforehand, you can lose consciousness and drown very easily. If you are planning to do deep snorkel dives, have a buddy and watch out for each other when you are submerged.

I dived the Coral Sea, off the northeast coast of Australia, many times. Always *Spoilsport* put us in great locations, steep edges, deep clear water with big animals. I love that too, but I always wanted to steam into the lagoon at Osprey Reef and anchor on the sand-flat by the back-reef margin on the windward side. Here, I knew that limpid ocean water flooded over the reef top and back-reef margin, across a shallow sand-flat of perfect sand a few metres deep, dropping away into the more turbid lagoon. Oceanic reefs are like that.

When the water is clear and there is sand below, the refracted shards of lucent turquoise seen through the surface can touch the soul. With a slick of biological material coming off a reef to windward,

Beveridge Reef, between Tonga and the Cook Islands, has exceptionally clear oceanic water, and sharks!

the oily surface is tamed in such a way that the net of caustic light patterns scattering across the bottom are completely entrancing, like an open fire.

For a photographer, the shallows have so much to offer. Light, of course but reflections too. With shallow water over a perfect reef in the calm, the upside down reef reflection extends to infinity, drawing you to its horizon. Lie motionless on the bottom waiting for your bubbles to clear, so you can use the Snell's window for creative effect. On rougher days you can shoot pictures of fish against the underside of the rafts of foam coming off the reef, or jam your camera against the rock to capture swirls of bubbles at slow shutter speed. You can shoot sea birds, or drifting rafts of pumice if there's a volcano handy, or explore mangrove forests by pulling yourself along by the aerial roots. You can experiment endlessly, because you have time. At least you do if the water is warm.

I love the way the meniscus pastes itself across the camera housing dome port in endlessly delicious curves. By angling the camera up, you can capture the scene above and below and the reflection of the bottom in the underside of the surface. Angling down, I can see both the image below and the subject refracted and disjointed through the surface.

It's not as though the shallows lack animals. I recall one dive outside the atoll of Takaroa, French Polynesia. There seemed to be no sharks at all, till I ascended and looked over the lip of the reef flat. There, grey reef sharks were occupying the niche of black tip reef sharks in half a metre of water.

Outside the reef, on the leeward side, swells from a distant ocean will curl in glassy perfection onto the reef, held up by what little wind there is. I love to snorkel here, to catch the exquisite glass tubes as they curl above and disintegrate in a maelstrom of foam and vortices.

Late afternoon the sun strikes the surface at just the right angle to be refracted into a jangle of golden lances like crepuscular rays. A warm gel on the flash will add consistent lighting to your foreground subject, and a high shutter speed will increase the definition of the rays.

When I think back to all the wonderful animals I have photographed while snorkelling, they have been my best times underwater. Humpback whales of course, once accompanied by a hundred melonhead whales and roughtooth dolphins, minke whales so close you could touch them and the lone friendly dugong in Vanuatu. Whale sharks at Christmas Island, and mako and blue sharks in New Zealand, one of which swam right through the cage. But we had left the windows open!

Animals don't need to be big to be fascinating; jellyfish have always been a favourite of mine including the first picture I sold, a compass jellyfish photographed off Sherkin Island. That day we snorkelled with a swordfish briefly (we were scared of becoming a kebab) and other people on my boat saw a leatherback turtle two metres long!

So you don't need to travel far, or to the tropics to find extraordinary animals underwater. You just need a mask, snorkel and fins, and a sense of adventure.

Pete Atkinson was a volunteers at Sherkin Island Marine Station over 30 years ago. Pete studied marine zoology at Bangor University, continuing a life-long obsession with the natural history of the oceans. In 1982 he bought Eila, a 1935 classic yacht, which he sailed all over Polynesia, writing articles and taking photographs. After 17 years and 45,000 miles, he bought Vigia, a 13.5m aluminium yacht to continue his travels in the Pacific. In 2004 Pete sailed to Cairns, bought a house, sold Vigia and married the Thai photographer Darin Limsuansub. They now live in Phuket, Thailand. www.peteatkinson.com

White tip reef shark, *Triaenodon obesus* at Minerva Reef in the South Pacific.

Avicennia resinifera mangroves in the clear water of the Matapouri estuary in New Zealand.

Angling for Beginners

By Paddy Byrne

RECREATIONAL Angling Ireland (RAI) was established to address how the different clubs, organisations and others in the angling sector could find a common framework for the future, and to work to increase participation in angling. The seven principal angling representative bodies were involved in its formation. The aim of the organization is to support all national angling bodies involved in coarse, pike, game and sea fishing.

RAI is a not-for-profit, country-wide voluntary organisation, constituted as a Company Limited by Guarantee. The Board is composed of Directors representative of the angling and related sectors with an independent Chairman and Company Secretary.

At a recent meeting of RAI, the Directors were happy to look back on ten years of work, culminating in a successful season in 2013, during which the Business Plan and Schedule of Events were realised.

The vision of RAI is: Ireland will remain as one of the best places in the world to fish. Waters will be clean and stocks will be plentiful. There will be respect for scarce environmental resources, which will be protected and developed in a sustainable way for future generations.

There will be a wide range of opportunities for both local anglers and visitors to fish in harmony and enjoy the experience. The lead organisations promoting and developing recreational angling will be well organised, providing excellent services to their members at all levels through sound management, operations, adequate budgets and appropriate policies.

As a representative body for anglers and others in the sector, Recreational Angling Ireland acts as a champion for the enjoyment, protection and development of the angling resource. It provides a mechanism for development of common policies and services, which helps to strengthen the sector and attract new angling participants.

Role of RAI

The primary role of RAI is to provide a focus for the recreational angling sector to work together on common issues that are best tackled in a coordinated way rather than each organisation, with its own limited resources, going it alone.

RAI works with Government and with key agencies including Inland Fisheries Ireland, the Irish Sports Council, Local Sports Partnerships and other NGOs to deliver on its remit.

Aims

RAI aims to:

- Develop and implement a targeted angling training programme.
- Deliver an education and outreach programme.
- Assist and support the national recreational fishing organisations.
- Raise the profile of the recreational angling sector.
- Secure additional resources and support to allow it undertake its work in a professional manner.

RAI runs the "ANGLING FOR BEGINNERS" programme aimed at all age groups, male and female. It is rolled out at different venues, catering for different types of angling, throughout the Island of Ireland. The programme has been expanded to encourage older/retired people to take up angling or, if they have fished in the past, to return to recreational angling. It is also inclusive of the less well off, socially and economically, in our society. In addition, events are also held within school extension programmes and community programmes.

These aims are consistent with the Government's policy of encouraging increased participation by all in sport and physical activity. Among the desirable effects are to counteract obesity and achieve community health and welfare.

The Events

One-day angling events led by qualified people are organized and supported by RAI to introduce people to angling. The beginners receive instruction in specific types of angling appropriate for each event location including coarse, game and sea. The overall approach is to introduce people to angling in a holistic way, such as emphasizing the importance of respect for people and the environment, the importance of good waterside manners, attention to health and safety and an appreciation of the beauty and value of our environment.

The training days are held throughout Ireland at coastal and inland venues. Approved RAI instructors are used together with aides and minders including parents. Some well known international angling medalists also help out. A risk assessment is done for each venue. The instruction consists of theory classes in the first half of the day, followed by hands-on casting and angling practice in the afternoon.

The instruction includes safety, country code and responsibility, clothing, set up costs, use of tackle, catch-and-release, practical fishing and the importance of Ireland as an angling venue. Each participant, on completion, receives a participation certificate.

A handbook setting out guidelines on how to organize an angling event are provided to assist those involved. RAI Directors collectively organise the events in cooperation with clubs and organisations. A Director coordinates the event at each location assisted by a local anchor person and a local team. The events held, so far have been very successful and resulted in many new young recruits to angling.

Education and Outreach

In the task of delivering an education and outreach programme, RAI people attend meetings and gatherings throughout the country in order to help anglers organize the business of running an angling club or association. The "Hand book of Angling Club Organisation" published by RAI is made available to interested parties to facilitate this business.

RAI also responds to calls to assist and support the national recreational fishing organisations in concert with other NGOs and, through attendance at meetings of the Inland Fisheries Forum and other national fora, exchange information and opinions on matters of mutual concern.

RAI has published four books for the use of angling Clubs:

- *Fish Facts Eolas ar Éisc – a bilungual book on Fish Biology* by Professor Peter Wilson
- *Guidelines for Angling Club Safety Statement* by Professor Peter Wilson
- *Handbook of Angling Club Organisation* by Paddy Byrne
- *Event Management Guidelines* by Paddy Byrne.

These publications are used to support our events and are available on request.

The Resource

A recent report from Inland Fisheries Ireland suggests that angling in Ireland is a significant resource. It provides welcome opportunities for novice and visiting anglers. However this finite resource deserves to be properly managed and conserved. The responsibility falls on us all to be involved, not least government agencies and non-governmental bodies, such as angling clubs.

Figures from Inland Fisheries Ireland demonstrate what our fisheries resource is worth to the country. Recreational angling is worth hundreds of millions of euro to the Irish economy and it sustains in the region of 10,000 jobs, with over 350,000 people from Ireland and abroad participating. Anglers have access to wild fish populations in our 74,000km of rivers and 128,000 Hectares of lakes together with 3,000+ Km of coastline and out to 12 nautical miles.

Ireland has a much more urbanised population than any time in our history and that means that our wildlife and countryside is even more important as a recreational amenity, a national treasure. Ireland is a beautiful, wonderful, country with a fantastic natural heritage and a diverse natural flora and fauna.

RAI is conscious of the conflicting interests attracting Ireland's young people and the pressures affecting their lifestyle as well as their mental and physical wellbeing. We believe that angling is a healthy option. Side by side with joy of angling, participants can get immersed in our wildlife and enjoy the biodiversity of Ireland's clean, green, environmentally friendly countryside. As well as fish and aquatic life there is terrestrial life including plants, birdlife, trees etc. The potential of angling in Ireland is enormous and it is truly a healthy option.

RAI works to attract and induct people of all ages into recreational angling, to introduce them to the skills required, to train them in safety and responsible behavior at the waterside, to introduce them to the local club and generally to imbue them with the joy of angling.

Since its foundation RAI has introduced up to two thousand people, young and old to recreational angling. The hope and belief is that once they experience angling they will go on to enjoy it for years to come.

RAI works to attract and induct people of all ages into recreational angling.

Images courtesy of RAI

Since its foundation RAI has introduced up to two thousand people, young and old to recreational angling.

People interested in running an event for beginners should contact us. For further information please contact: Hon. Secretary Patrick F. Byrne Tel: 087 2906866 E pfbyrne5@gmail.com. www.recreationalanglingireland.com

Rewarding encounters with polar bears in high latitudes

Arctic Fern on arrival at the position where we were forced back.

Two bears taking a good look at us.

The bear that found open water for us.

By John Gore-Grimes

WE had sailed from Howth, County Dublin to the North Cape at the very top of Norway and we hoped to sail from there to the Russian archipelago named Franz Josef Land. It comprises a host of islands on and above latitude 80 degrees North. It is a remote and forbidding place. Nobody resides there.

We had read the ice reports and had scanned the ice charts with great care. It was clear from the start that the heavy concentrations of ice were such as to render the chances of reaching Franz Josef Land completely impossible.

The voyage from the North Cape to Franz Josef Land is just in excess of six hundred nautical miles. We sailed just east of north for some three hundred and twenty nautical miles before engaging with polar ice. The ice was navigable for a while but by the time we had achieved a further distance northwards of about forty miles we were faced with a solid wall of ice which made any further progress absolutely impossible. Indeed, we were soon surrounded by and trapped in ice to such an extent that it was a simple matter to step off the boat and go for a walk.

We hacked away at the ice with heavy, spiked steel poles and with ice-picks.

Two days later the fog rolled in. It was thick cold and damp. With fair to good visibility it is easy to keep a look-out for polar bears. When hunting they are swift and silent. They are skilled at hiding behind the ice hummocks, which litter the frozen sea. Polar bears hunt on the ice floes. They are perfectly disguised and it is their motion and not their colour, which betrays their presence. They strike and kill unwary seals, which come to the surface of a pool or lead in the ice. In the conditions which we experienced a "bear watch" was essential As the fog wafted about us, at times, if you stretched out your arm and raised and raised your thumb, you could barely see it.

I was on watch at 2 am. It was day-light at those latitudes but visibility was no more than five or six metres. Suddenly I spotted something black on the snow-covered sea-ice. At first I thought that it was, perhaps, a small stone……but then it started to move. I grabbed the rifle and held it at the ready. As the 'stone' came closer I could just make out the white outline of a very large polar bear which was almost, but not quite, hidden by the fog. That bear came close to the 'stone', which turned out to be the very black nose of a very small bear cub. Mother bear came up to her cub. She picked some snow, which lay on the surface of the ice and covered her baby's nose with it. All-at-once the black stone disappeared and as mother bear stood between her cub and the side of our boat I noticed that her nose was covered with snow also. The disguise had worked and within seconds both mother and cub were out of sight well wrapped up in the cold thick fog which surrounded them.

Some eighteen hours later the fog had cleared but our predicament, in those solid fields of sea-ice, had not improved. The hull of the *Arctic Fern* groaned as the surrounding ice squeezed her in its constant battle for position among the many large and tightly concentrated floes. Our attempts at hacking and pushing the ice had been a feeble effort, which had earned us very little progress southwards. There were little pools of water here and there but we could not find the leads, which frequently connect them.

We heard a loud roar and, at once, sighted a very large bear, which must have been moving along secretly behind the hummocks. When we first sighted him he was standing up on his hind legs. He appeared to be about three metres in height. We watched him for a while and we came to the conclusion that we should make every effort to follow him as he went forward to the south, all-the-while turning around to look back at us. We followed and soon found ourselves in tight leads, which we worked on to make them wider and to create a narrow but navigable water path.

We worked away for, at least an hour and a half poleing and hacking until, all of a sudden, we found ourselves in more and more larger open water pools. At that point the bear looked back at us as if to say: "The rest is up to you."

Suddenly the bear was gone. He had disappeared behind the ice hummocks, which are everywhere in these frozen seas.

It is hard to believe that a wandering bear, which had guided us for one and a half hours, was a pure coincidence. He may have been moving south in search of seals. Indeed, he may have been weighing up the odds of his chances of getting aboard the *Arctic Fern* and dining out on one our two of its crew members. The conclusion of all on board the *Arctic Fern* was that the bear had delivered us from perilous circumstances.

Once free of the ice we set sail and headed west-sou-west for Svalbard. We arrived there some four days later.

John Gore-Grimes, Shack, Baily, Co Dublin.

Image courtesy of Robbie Murphy

Our Crowded Skies

By Daphne Pochin Mould

LOOK at the sky. What do you see? Empty space? Look again. All movement – flying animals of many sorts and sizes going about their affairs, knowing where they are going. A sky full of modern aircraft could not do it, nor would attempt it, yet our celestial wild life needs no flying school or electronic aids to follow its incredible flight paths. A long-haul flyer who makes yearly trip south to north for a summer of love making and family life. Humans can do that too but we lack the swift aerobatic mobility and its sight. That incredible eyesight which can spot a small edible insect in flight and steer a course to intersect with it, snatch it and eat it.

Or look up at the sky of summer, even the lordly gannet is cruising along. But also looking down through space into the depths of the ocean looking for fish. Then he drops like a stone on this body built to take the shock of iron hard water and makes his catch and his dinner in a single swoop.

Many big birds like the albatross are capable of long sustained high level flight and some may be able to hitch a ride on high level jet streams of air. It seems that butterflies can also do this for these so fragile flying machines do arrive by aerial migration. The old cartoon of a caterpillar looking up at a butterfly and saying "You won't get me up in one of those contraptions" comes to mind!

Long distance flight by a heavy bird, whether helped by wind or not, requires a lot of "engine power" and reserve of "fuel". These big birds haven't much reserve apart from when the winds allow them to glide and soar. Unless you are a glide pilot you are unaware of the hidden topography of the air. Skillful and alert pilots of aircraft have been known to glide long distances by recognising the right conditions and saving fuel. Knowing about cloud types and weather is vital if you are to look up and find meaning in the flyer's world. A vivid flash of blue is the kingfisher's path above the stream. The bumble bee going about its business, though in the air it is not a flying machine. The honey bees working in the flower bed back and forth to their hives, finding them accurately on each trip.

Questions of how far creatures that metamorphose know of great changes come to mind. Do tadpoles have visions of leaping frogs? A change of nature so basic of cabbage-devouring caterpillars changing to highly coloured and agile butterflies is one to puzzle the human mind. Yet in myth and fairy story we have played with it: the princess who kisses the frog and behold, her handsome Prince.

What is even more wonderful are what seem like in-built navigation systems in animals other than ourselves. Lines of magnetic force cross the globe and can be detected and followed with a compass. Further the earth's magnetic field is always changing. Each year a new compass variation is to be followed if we are to arrive in the right place. But wildlife does all this with neither computer nor maths. The swallow after flying many air miles over land and sea arrives exactly at last year's nest. Think of the journeys in human terms, driving from Cape Town and across Africa, central Europe, the English Channel and on through Britain. Small birds at risk of being nabbed by some bird of prey en route.

Think of the long flight by the big bird where considerable muscle power is needed. They might even emigrate. A black albatross swept off course by the violent winds, moved in with a colony of gannets and stayed.

Some tagged whooper swans on their way back to Iceland for their summer nesting were thought to be lost but with their wings covered in warm waterproof feathers they had just set down on the sea to ride it out. I cannot imagine anything more delightful than being on the surface of the sea on a warm winter coastline, enjoying its every movement and riding up great waves.

Some day we may learn much more of life in our crowded skies, meantime we can only watch and wonder.

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Discovering Different Aspects of Reality

Image courtesy of Robbie Murphy

By Alex Kirby

SEPTEMBER 2013 saw the publication of AR5, the Fifth Assessment Report produced by the Intergovernmental Panel on Climate Change. You might think, from some of the press coverage beforehand, that it was destined to be a magisterial declaration of exactly what humanity now knows about the prospect of a dangerously warming world.

Steady. That way disillusion lies. This report, like its four predecessors, spells out more clearly what we still don't know than what we do. It provides few satisfyingly complete answers. Like the earlier four it's work-in-progress, a rough approximation – and none the worse for that. That's what science is. Scientists are the supreme sceptics. They develop the best theory they can to explain what they know, then proceed to test it to destruction with each new piece of evidence that comes to light. In its quarter century of existence the IPCC has not yet managed to demolish its theory. But it has clearly recognised the gaps in its knowledge that need filling. Donald Rumsfeld, whatever else he did, at least gave us several useful concepts. And he'd be at home in a climatologist's laboratory, with its serried ranks of known – and unknown – unknowns.

At the Climate News Network we try to reflect this muddled version of reality. We don't set out to carry every news story which supports a settled position – because we don't have a position. We try instead, with the one or occasionally two daily stories we publish, to choose the most significant and interesting news that day, and to report it accurately and in context. And that can lead to some apparent contradictions.

One example is sea level rise. On 10 July, in a story headed "Greenland faces 'modest' but risky melt", we reported: "Greenland's contribution to sea-level rise between now and 2200 is likely to be relatively modest, scientists say. But they couple this with a warning against complacency over the possible consequences of even a fairly small rise." Yet just five days later, under the headline "Sea levels 'are set for continuing rise'", we wrote:

"Sea-level rise may be slow to show its hand but once it really starts, researchers say, it will keep going for centuries, with baleful effects. For each degree by which the Earth warms, they believe, sea levels will probably rise by over two metres. Some recent research has suggested that the future rate of sea-level rise may not be as fast as scientists had expected. But a study published in the Proceedings of the National Academy of Sciences, *The multi-millennial sea-level commitment of global warming*, paints a different picture. Today's greenhouse gas emissions will cause sea levels to rise for centuries to come."

It's perhaps not too easy to reconcile the two reports, at least not without thinking hard about them. We believe that our readers do think about what we report, and that they would prefer to be faced with apparent inconsistencies than to be offered some pre-digested and partisan account of what's happening. And that's what the reality is: different groups of researchers are discovering different aspects of reality, feeding them all into a better understanding of the global jigsaw which is the climate system.

Or take the controversy over the apparent slowdown in climate change this century. Some say it means the global average temperature has not risen for the last 15 years or more. Others say the warming has continued, but the extra heat has not gone into the atmosphere: it's gone into the ocean depths instead, or it may have been partly masked by aerosols produced by human pollution and by volcanoes. So on 3 July our report said:

"The World Meteorological Organization says the planet 'experienced unprecedented high-impact climate extremes' in the ten years from 2001 to 2010, the warmest decade since the start of modern measurements in 1850... Sea levels rose about twice as fast as the trend in the last century. A WMO report, *The Global Climate 2001-2010, A Decade of Climate Extremes*... says the decade was the warmest for both hemispheres, and for both land and ocean surface temperatures. There was a rapid decline in Arctic sea ice and accelerating loss of net mass from the Greenland and Antarctic ice sheets and from the world's glaciers. This melting and the thermal expansion of sea water caused global mean sea levels to rise about three millimetres annually, about double the observed 20th century trend... "

What next? Well, bang on cue (almost – on 23 July, actually) came the counterpunch in our story "Climate warming slows: no surprise yet":

"Here is an interim update on the uncertain future of climate change: it remains uncertain and all forecasts are, for the time being, interim. British scientists say that global warming has slowed down. Their climate models predicted periods in which warming would slow before speeding up again, and this slowing down is within their calculated limits of uncertainty: they had not, however, expected the slowdown to happen for a decade or more. But it is happening now."

And there are those wonderful stories that seem to fly in the face of received wisdom, like the one on 28 July, "Scientists mull Arctic's slow CO_2 loss". It reported: "The levels of Arctic permafrost that thaw each year and freeze again are growing at depths of 1 cm a year, but the carbon locked away in the soils is – so far – not being released at an accelerating rate." That's odd – and it's contrary to what most of us had thought was happening.

What is the busy reader to make of this constant drip-feed of inconsistencies and contradictions? Some may conclude that the scientists know so little about what they're studying that it's better to ignore them. I think that's far too glib and easy a dismissal, though.

In our story on the World Meteorological Organization's decadal report we used a quote by the WMO secretary-general, Michel Jarraud which can help to set the confusion in context and to make good sense of it: ""Natural climate variability, caused in part by interactions between our atmosphere and oceans – as evidenced by El Niño and La Niña events – means that some years are cooler than others. On an annual basis, the global temperature curve is not a smooth one. On a long-term basis the underlying trend is clearly in an upward direction, more so in recent times."

The last story I wrote before retiring from the BBC in 2005 involved an interview with Dr Geoff Jenkins, the then head of climate change prediction at the UK Met Office's Hadley Centre. He said:

"The big problem is the uncertainties. But the science is hardening up quite a lot, and it's come on by leaps and bounds since the Intergovernmental Panel on Climate Change first met in 1988. There's been enormous progress in observations, in our understanding of the processes and our modelling of them – they've all moved on brilliantly. The more you understand, though, the more you realise how much you don't understand. In some areas our ignorance is woeful."

I'll remember Dr Jenkins as I read the new IPCC report.

Alex Kirby is a former BBC News environment correspondent. Alex now runs a website, Climate News Network, providing a free, ready-to-use factual service that brings you the latest news of climate change science. Web: www.climatenewsnetwork.net

Rural areas as engines of economic growth

The contribution and potential of rural businesses and communities has often been overlooked in the policymaking process. Could more be done to encourage their growth?

Image courtesy of Rural Economy and Land Use Programme

RURAL areas contribute at least £211 billion a year directly to the English economy but have great potential to achieve even more. During the decade to 2010 our countryside and smallest settlements achieved higher rates of growth in numbers of businesses and jobs than any other settlement category in England. Cuts in public spending and the need to rebalance the economy means that our expectations of what private and social enterprise can achieve in employment, wealth creation and service provision have increased. We must, therefore, see growth across the whole country rather than only in certain cities or sectors. The distinctive characteristics, business and employment structure and past performance of rural economies mean that they are well placed to meet this challenge.

What is 'the rural economy'?

Land management industries are important to us all – we depend on their provision of food, timber, water, energy and other goods – but the rural economy reaches far beyond this in terms of jobs, enterprises and output.

The rural economy can contribute to all the economic sectors, and is affected by all of the pressing challenges (infrastructure, planning, finance etc) that feature in national and local growth strategies, yet its contribution is often handled separately and focused on farming or tourism:

- Manufacturing, wholesale and retail, construction, education and health, public administration and professional and business services sectors flourish in the countryside and many leading global, European and national businesses operate from rural areas.
- Land management provides a wide range of ecosystems services, including not only production of food, timber and energy, but also provision of clean water, leisure facilities, carbon storage and flood management.
- Rural areas display high levels of entrepreneurship, with more businesses per head of population than in England's towns and cities.
- Most city economies are well supported by commuters, businesses, consumer and environmental services from neighbouring rural areas.

Just as firms vary across towns and cities, so the mix of business sizes, sectors and performance varies across rural areas:

- Manufacturing and professional firms are more likely to be found in and close to rural towns in less sparse areas.
- Micro-businesses, social enterprises and self-employment make a more significant contribution to rural employment and services than those in urban areas.
- The high levels of entrepreneurship are partly driven by large numbers of home-based businesses, (especially those run by women), by self-employment and by incomers.

Why are rural economies important?

Cuts in public spending and the need to rebalance the economy reinforce the need for economic growth and innovation to come from all areas and sectors, not just from urban centres. **Rural businesses already make a significant contribution to economic growth:**

- They currently represent around 28% of England's firms.
- Rural areas contribute at least 19% of Gross Value Added to the English economy.
- Healthy environments are known to make critical contributions to economic growth and society's wellbeing. Stewardship of the rural environment is central to achieving this balance between economic growth and environmental and societal wellbeing.
- Rural economies have demonstrated their potential to provide more growth and employment if given appropriate stimuli and support from national and local business leaders and policy makers.

How does the rural economy offer opportunities for growth?

Rural areas have a number of dynamic features that enable economic growth:

- Rural areas have more business start-ups per head of population than many urban areas.
- Firms started by people moving into rural areas are more likely to sell their products and services on national and overseas markets, thus earning revenue beyond the locality.
- Many manufacturing businesses are located in rural areas and this sector provides a higher proportion of rural jobs than are supported by urban manufacturing firms.
- Rural economies have pioneered privatisation and community provision of many local services, fuelled by a combination of delivery and access difficulties and the distinctive nature of rural demand.
- As the economic value and potential of ecosystems services are recognised these will offer increased opportunities for growth.

What barriers are holding rural economies back?

There are also some key weaknesses to be found in rural economies:

- Low densities and dominance of very small firms, especially in sparse and peripheral rural areas, can lead to a poorer choice of local employment opportunities for rural residents.
- Lower business revenue and lower productivity in some sectors leads to many rural jobs offering lower pay.
- Affordable housing for employees is limited in many areas. When combined with poorer public transport, greater distances between firms, this presents employers with difficulties recruiting or retaining staff, and adds to higher average living costs than for workers who are residents in towns.
- Fuel costs are high for firms and for employees who need to commute.
- Lower levels of local authority funding are available for spending on consumer services and economic support.

Rural businesses are as likely to want to grow as their urban counterparts. But many types of rural businesses report practical restraints on their development, principally relating to:

- Accessing and managing finance, exacerbated by closure of rural branches of high street banks.
- Regulation and planning requirements, sometimes made worse by planners' and residents' views of what are appropriate forms of businesses for rural areas.
- Infrastructure provision and premises, particularly for firms wishing to expand.
- Access to services, markets, networks and communications infrastructure, including mobile coverage and broadband, that most urban firms and residents take for granted.
- Recruitment of suitably skilled staff.

What changes are required if rural economies are to fulfil their potential?

All rural businesses must innovate and develop in order to be viable and need support and encouragement to do this:

- The diversity of growth challenges in rural industries must be addressed in a targeted way. For example, agriculture has some of the lowest growth aspirations and is constrained by an aging workforce, while manufacturing has the highest growth aspirations but is challenged by inadequate sites and premises.
- Two thirds of rural firms are micro-businesses, employing fewer than 10 employees, and these need particular attention as they often fall below the radar in any investigation of the rural economy:
  - They are more important for employment in rural than urban areas.
  - They have limited in-house resources.
  - Their goals and motivations are very diverse.
  - They are often family-based.
  - Many are reluctant or unable to take on new staff.
  - Many are home-based. These are often the most profitable firms, but many say they need better access to business advice and grants, improved IT and opportunities for business collaboration.
- Workhubs offering flexible work premises would be helpful, providing access to shared facilities and reducing isolation.
- Business associations and networks could be more proactive in engaging these small businesses and providing mentoring and other support.
- Business leaders – from the private as well as the public sector – seeking out and speaking out for the experience of rural businesses would help to ensure that core business and innovation policies are sensitive to rural needs.

What are the messages for decision makers at local and national level?

Effective and transparent rural proofing of growth plans and policies across all business sectors is needed in order to tailor measures to rural conditions and assess their applicability to rural economies:

- Rural growth measures have been more fully developed for the land-dependent sectors of farming, forestry, food and environmental services. Whilst these are important for the nation, in many rural areas we need to look to other sectors that are the primary engines for growth.
- Rural economies should be treated as cross-cutting and embedded in mainstream policies and plans for economic development.
- At a national aggregate level it is easy to overlook important differences in urban and rural businesses and labour markets; a closer examination at a finer scale reveals important variations in spatial, sectoral and size profiles.
- There is a need to further demonstrate ways that firms can realise the value of the natural environment to business growth, by securing efficiencies and developing new products and services.
- A tailored, place-based approach is required, meeting local constraints and opportunities. Strategies for growth must respond to local variability and drive resources to rural economies at local level.
- A review of the needs and opportunities for rural and home-based micro-enterprises would complement the review of mid-sized firms within the Government's Plan for Growth.
- Rural households and communities form the bedrock of our rural firms, and bolster their innovative capability and resilience. This is particularly apparent in times of economic pressure. Strengthening local business and community institutions and facilitating community engagement will pay dividends.
- Investment in affordable housing and local services is essential for employee recruitment and new business development.

The Rural Economy and Land Use Programme is a UK-wide research programme carrying out interdisciplinary research on the multiple challenges facing rural areas. It is funded by the Economic and Social Research Council, the Biotechnology and Biological Sciences Research Council and the Natural Environment Research Council,, with additional funding from the Scottish Government and the Department for Environment, Food and Rural Affairs.
www.relu.ac.uk

Glengowla Mines

Discover the hidden beauty of Connemara

By Susan Connell

FOR years, tourists and Irish families have flocked to Connemara to enjoy the beauty of its rare and beautiful landscape. Thousands have marvelled at its mountains, peat bogs, mirror lakes and Connemara ponies. But what if I told you that the beauty of Connemara begins not at the tip of the mountains but deep below the surface?

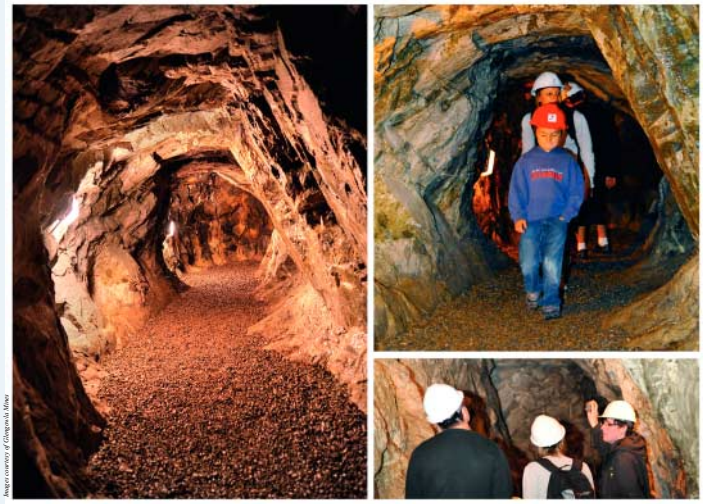
Situated 3km outside the village of Oughterard is Glengowla Mines. It is here, a journey deep into the heart of Connemara can be taken. The lead and silver mines which operated from 1850 – 1865 have been restored by the Geogheagan family and are open to the public for guided underground tours. A visit to the museum will set the scene as your guide takes you through the different types of rocks and minerals found in the mine and how they are formed. This is not only a feast for lovers of geology – anyone with an interest in nature, history or culture will soon become enthralled in the story. As you travel 40 metres beneath the surface be prepared to be amazed at the caverns of marble studded with lead and silver and marvel at the rare and beautiful crystals of quartz and fluorite. Visitors can follow the veins of copper pyrite which will lead them to the 'miners gold' galena.

For those interested in the working life of a miner in post famine times, the constant dripping of water, 'miners breath' and a moment of darkness sets the scene. The tour guides give an indepth account of the working lives of the miners and their struggle to make a living in the mine.

After the Great Irish Potato Famine (1845 – 1848), destitution, disease and death were rampant. Very little work was available in the Connemara area, leaving locals with little or no means to restore any type of normal life. In 1851, work started in earnest at Glengowla Mines, giving much needed employment to some 300 workers. The working conditions were far from ideal. Working on a piece by piece pay rate, workers were only paid for the Galena they mined while working in the mines. They also had to rent their equipment from the mine and pay the blacksmith to sharpen their tools. It was extremely difficult to make a living but no other form of work was to be had. The goal of most miners with no family commitments was to save for a boat ticket to America in the hope of starting a better life across the Atlantic. Often, shifts lasted 12 hours with workers not seeing daylight from beginning to end of their shift. Candle light was their only form of light, as a result, many miners eye sight suffered. Due to the surrounding bog lands, the mines continuously filled with water. A pump operated throughout the day to keep water levels at a minimum. However, mine workers often ended up working in water levels up to waist high. The miners used hand drilling and blasting to remove rock and ore from the mine. The blasts were set by packing drill holes with gunpowder and a fuse was made by filling a single shaft of straw with gun powder. This fuse was then set alight with the 'blaster' beating a hasty retreat to safety. The mine was in operation until 1865 when it became too costly to transport the Galena to England. Over time, the mine completely filled with water and lay like a sunken wreck with all her secrets intact for over 130 years. Today, the underground tour plus a visit to the paymasters office, the gun powder house and blacksmiths workshop on the surface give an interesting insight.

A big hit with adults and children is the opportunity to take part in some gold panning at the Glengowla Gold Panning Station. What is best of all you get to keep any gems you find!

Located on site is also a working seismograph which is part of the National Seismic Network. Glengowla have developed an exhibit where you can see how it measures the movement of the earth and how earthquakes in faraway countries can be felt on the seismograph in Connemara. Due to the high level of interest by visitors in the seismograph, Glengowla have decided to further develop the exhibit to add more interactive elements and an education program. These developments will be coming on line in the coming months and will be a treat for everyone to enjoy.



Images courtesy of Glengowla Mines

Glengowla Mines – caverns of marble, studded with lead, silver and rare and beautiful crystals of quartz and fluorites.

The underground mines and the many interesting buildings on the surface, give visitors a great insight into mining in the 1800s.

The blacksmiths workshop.

Panning for gold at the Glengowla Gold Panning Station.

Open from March to November, visitors can drop in anytime. Interested in a tour during off peak season? Just call ahead to +353 87 2529850 or check out our website: www.glengowlamines.ie Admission: Adult *€10.00; Child €4.00; Student/Senior Citizen €9.00. Family Ticket €25.00 – 2 adults & 2 children*

Publications of Interest

Burren Insight

www.burrenbeotrust.com

Burrenbeo Trust, Main Street, Kinvara, Co. Galway

Issue 5

2013/€8.00

Another excellent issue from the Burrenbeo Trust. The editors continue to give readers wonderful and interesting articles about Ireland's special landscape, the Burren. Declan Kelleher tells how this landscape holds extraordinary potential as a learning resource within the Irish education system. As a teacher he has seen at first hand how children react with huge positivity and creativity when taken out in the Burren. He recommends short class trips to schools near the Burren and one-day school tours for distant schools. He describes the learning experience the Burren provides such as Portal tombs, dolmens, Colman MacDuagh's Church under Eagle's Rock, tower houses and heritage site buildings.

Paddy Hynes a retired Carron local aged 84 shares his memories of life and farming in the Burren. In his early years at school each family paid 2 shillings each week for coal. His mother made the clothes for himself and his four sisters and he spoke of how his father bought a suit for £1 and a hat for 1 shilling after selling a heifer for £13 at Ennistymon fair. He also tells of learning how to plough with horses, about the local postman, the weather man and much more.

We learn about the Burren Atlas Project which is surveying the large number of unrecorded archaeological remains surviving on the Burren uplands. This project may enthuse people in other areas throughout the country to follow suit. Other articles include The Burren Community Charter, Caher River – a portrait; Growing veggies on Fertile Rocks. Yes, another superb issue on the Burren.

Matt Murphy

Landscape and Society in Contemporary Ireland

Brendan McGrath

Cork University Press

ISBN: 978-190900-571-6

2013/€39.00

The author, a profession planner, examines the threats to Ireland's landscape from modern planning and development. He looks into the uneasy relationship between today's Irish society and the spaces it inhabits, and how different people view the landscapes about them. Historic and semi-natural landscapes are deeply rooted in the culture of Ireland but, as he says, even bogs (so central to government carbon policy) find little public support. Leisure has replaced livelihood in the countryside, suburban sprawl and a car culture are the norm, and dispersed housing has a major impact. The book weighs this materialist perspective against the "sense of place" defined by the late Seamus Heaney and others. The author quotes writer Nuala O'Faoilain: "I am watching the transformation of one Irish townland from an ancient agricultural settlement into a middle-class suburb." McGrath in no way argues for a return to the past, but is a sensitive and passionate plea to retain what is good in the landscape within the context of greatly improved living standards.

The last chapter looks at the future of the Burren and the World Heritage Sites list submitted in 2010 by an Irish government whose "commitment to landscape protection rarely extends beyond the aspirational." The author argues that these areas of huge cultural importance and tourist potential all should be, like the Abruzzo mountains near Rome and other sites in Europe, 'IUCN Category V' nature parks where local initiatives are supported by wise government intervention. There may be a way forward in the Burren, where, as the author shows, an EU LIFE initiative and subsequent Farming for Conservation programme, with other ecotourism and landscape initiatives, is doing much to protect both countryside and local livelihoods.

In the wake of the collapse of the Irish property bubble, this book is an important contribution to debate about the future of Ireland's remarkable, irreplaceable and evocative landscape.

John Akeroyd

The Birds of Ireland
A Field Guide

By Jim Wilson
Photographs by Mark Carmody

The Collins Press, in association with BirdWatch Ireland

www.collinspress.ie

ISBN: 978-184889-179-1

2013/€14.99/ pp 272

Here is both a concise, handsomely illustrated, up-to-date account of Ireland's birds and model field guide. Layout and presentation are imaginative, with, for each species, carefully assembled photographs that show life history and seasonal variation. An information bar presents basic data: size, best season to see, breeding status and habitat. Then follow short notes on general appearance, flight and voice. The book provides exactly the information required, without excessive detail or digression. Coverage is comprehensive (over 260 species) and pages are set inside for shorter accounts of those rare birds that can so easily turn up. A short introduction covers basic identification, equipment and bird conservation; and at the end are lists of useful websites and twitter accounts, a basic bibliography and indices of English, Irish and Latin names. Best of all the book relates (unlike most bird and flowers guides) specifically to Ireland. This sturdy paperback also fits well in the pocket.

John Akeroyd

Bird Habitats in Ireland

Richard Nairn and John O'Halloran (eds)

The Collin's Press

www.collinspress.ie

ISBN: 9781848891388

2012/€34.99/ pp 306

Birds are not only an important but a deeply popular element in Irish biodiversity. This attractive book looks at Ireland's birds from a fresh angle. It not only gets away from bird identification and distribution, but also provides a popular account of Irish habitats. Above all it investigates why the birds of Ireland are different from those of Britain and Europe.

The editors have ably woven together the work of 25 contributors, making the book eminently readable yet retaining a strong scientific base. After a general look at habitats, Chapters 4-15 cover the whole range of wetland, bogland, heath, woodland, farmland, coasts and over-expanding urban habitats. For birds, habitat structure (e.g. dead wood) is as important as vegetation composition, and they are remarkably adaptable to man-made structures and activities.

Chapter 16 considers a series of management case histories, most but not all successful, while Chapter 17 looks into the vexed issue of climate change. The text is copiously illustrated with photos of habitats and birds in their habitats, and simple statistical tables provide hard data. There is a checklist of Irish birds, and the book ends with a thorough 22-page bibliography.

Chapter 18 is at the core of the book, providing a synthesis of previous chapters, summarising the distinctness of the Irish bird fauna (for example, many European woodland birds occur in farmland or urban areas in Ireland), and looking to the future. One happy trend is the increase in recent colonists such as Reed Warbler, Little Egret and Great Spotted Woodpecker. Conversely, some 'traditional' farm birds such as Corncrake and Yellowhammer are threatened. This book provides a firm basis for future work by professional scientists and their small array of non-professional volunteers.

John Akeroyd

Secrets of the Irish Landscape
The Story of the Irish Landscape is the Story of Ireland

Matthew Jebb and Colm Crowley (eds).

Cork University Press/Atrium

ISBN: 978-1-78205-010-0

2012/€29.00

The Irish Landscape has a fascinating, complex history that feeds into science, culture and national identity. Based on an RTE television series, this larger-format, colour-illustrated book explores how geology, climate, vegetation and substantial human impact have shaped the island over the millennia since the glaciers retreated. The starting point of the team of more than 20 researchers is the work of Robert Lloyd Praeger (1865–1953), who travelled all through Ireland in search of plants – and the answer to the riddle of the origin of the Irish flora.

The book follows up Praeger's quest with a fascinating account of how Ireland emerged from beneath the ice, with perhaps at least a fragment of its native flora intact. For DNA studies have revealed that the population of Arctic Sandwort (Arenaria norvegica) on Ben Bulbin may have existed there for hundreds of thousands of years! The story continues with the recolonisation of Ireland by trees, clearing by farmers, climate change and the rise and fall of rural societies, including the monastic 'Golden Age', which saw agriculture and settlements expanding, the arrival of the Vikings, who developed trade and towns. There are essays on bog burials, drystone walls, tree-ring analysis and the fateful potato; also the history of mapping the Irish landscape, notably the Ordnance Survey. One on Famine and Landscape outlines the profound changes wrought by the hungry 1840s, followed by depopulation and the emergence of today's Irish rural scene.

The editors and authors take up themes earlier explored in the work of polymath Frank Mitchell in the 1970s–1980s, in editions of The Irish Landscape. Reaping the fruits of subsequent research and modern technology, they and RTE have been able to take the story to an even wider audience, bringing the distant past to life.

John Akeroyd

The Sea Garden
A Guide to Seaweed Cookery & Foraging

Marie Power

www.theseagardener.ie

ISBN: 978-0-9575020-0-0

2013/€14.50 inc p&p

Not everyone is confident about bringing home seaweeds from the shore and cooking with them. What seaweeds can be eaten, where on the shore do you find them and how can a green, red or brown slimy algae be turned into a tempting dish? *The Sea Garden – A guide to Seaweed Cookery & Foraging* is a really friendly and accessible book for someone starting out on this culinary adventure. By only featuring 10 easily found and recognised seaweeds, the author is making the first step very easy for us. Each seaweed is fully described and well-photographed, making identification easy and the diagram on page 22–23 points us to where on the shore we need to look. What is also great is that there are sweet and savoury recipes for each seaweed – so whether you have a sweet-tooth or a savoury one, there's something for everyone to try. The author, Marie Power, grew up on the Waterford Coast and was given seaweed from an early stage because it was considered "good for you". She is passing on all her knowledge to us in this beautiful little book, which is small enough to put in your pocket when you hop down to shore to forage for seaweeds.

Susan Murphy Wickens

Sustainable Communities
Creating a durable local economy

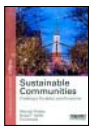
Rhonda Phillips, Bruce F. Seifer & Ed Antczak

Routledge

www.routledge.com

ISBN: 978-0-415-82017-2

2013/£24.99



"Top City for the Next Decade", "Happiest Small City in US", "10th lowest unemployment rate in the nation" and second lowest foreclosure rate in the US in 2010 – that city is Burlington, Vermont, USA. Thirty years ago this city embarked on a new approach to community and economic development with the mission of fostering economic vitality: preserving and enhancing neighbourhoods, quality of life and the environment. The authors briefly review specific economic development strategies and these are outlined in 10 steps, with a number of suggestions for each. These strategies alone make purchasing the book worthwhile for communities. In his Foreword to the book US Senator Bernie Sanders said "But I do hope that people will absorb what I think is the book's most important, and proven, message – that when you work to meet the needs of all residents, a city will shine in a special way, and will become an inviting place where others will want to visit, live, and do business."

The first chapter focuses on the political economy sector and how that influences so many other aspects of community economic development. Chapter Two centres on employee-owned enterprises, buy local campaigns and a living wage ordinance. Chapter 3 shows the importance of including all in the economy. Also it details how to expand women entrepreneurial skills. Chapter 4 is about fostering community development. Chapter 5, 6 and 7 outline the social and environmentally sustainable economy sector. Chapter 8 sums up lessons learned and other insights, including staying focused on present needs, doing the homework, thinking local, keeping up with the times, leveraging resources, developing leadership and nurturing local businesses. The appendix outlines year by year from 1983, 200 initiatives that were accomplished over a 30 year period. This is truly an invaluable book, a must for anyone involved in the economic, social and environmental development of a town or city.

Matt Murphy

Managing the Transition to a Sustainable Enterprise
Lessons from frontrunner companies

Rob van Tulder, Rob van Tilburg, Mara Francken and Andrea da Rosa

Earthscan from Routledge

www.routledge.com

ISBN: 978-0-415-71613-0

2014/£26.99

This book is about how sustainability within organisations can be shaped. It uses a study of 20 large companies based in the Netherlands, spread over 20 different sectors, to find out how they dealt with this process. The companies include Philips (electronics), Port of Rotterdam (harbour infrastructure), Royal FrieslandCampina (dairy products), Rabobank (banking) and Unilever (food processing). As stated however it does not imply these companies have actually achieved sustainability and thus can be considered 'best practice'. Rather they provide 'relevant practice' because of their frontrunner status. At the beginning of each chapter there is a synopsis 'This chapter in two minutes", which makes the book extremely accessible and allows the reader to quickly access relevant information. There are 9 chapters in all – one and two assess the state of the world regarding sustainability issues and elaborate on the idea of sustainable development. Ways the phenomenon can be explained are looked at, particularly its increasing importance to companies. Chapter 3 focuses on the arguments in favour of sustainable enterprise, on ways that it adds value and how companies can capitalise on that. Chapter 4 is about the transition to a sustainable enterprise and describes an in-depth model. Further chapters go deeper into the role of external stakeholders and provide insight into the way in which companies move through the phases to finally realise the transition to higher levels of sustainability. This book provides excellent models and lessons on how to achieve a sustainable enterprise.

Matt Murphy

THE GREY WOLF

(*Canis lupus*) in Ireland

By Dr Kieran Hickey

WOLVES had been in Ireland for a very long time and dated bones stretch their existence here back well into the last ice age. Modern day Arctic wolves, a subspecies of the Gray wolf (*Canis lupus*), still survive and thrive today in similar environmental conditions to Ireland's at that time. Wolf bones show up in a number of archaeological sites from the arrival of the first humans into Ireland. Firstly, of course they could be the remains of wolf kills, either hunted as a trophy or more likely hunted because of their predation of domestic animals especially sheep and their potential threat to humans. However, the trophy possibility should not be discounted and a wolf skin would make a very attractive animal pelt and possibly even a very potent symbol. Secondly, if wolves are present in an area it is possible that wolf cubs may have been taken and tamed to be used for hunting or fighting and again adopted as a status symbol. The Brehon laws from the second half of the first millennium refer to wolves being kept as pets by Irish chieftains.

Cultural connections

Culturally, evidence shows wolves have been very important in Ireland although much of this information is forgotten or difficult to access due to language issues. For example, a wide variety of place names includes references to wolves. So taking the county of Cork you have Knockane (Cnoc Mhic Tíre) which translates as Wolf Hill, mac tíre being the modern Irish for a wolf. There is also Breaghna in the parish of Desertserges and Britway both derived from breaghy meaning wolf plain or wolf field and the most common element in wolf place names across the country. Near the Mine Road outside Durrus you even have Wolf Hill showing that wolves survived down in the modern era.

Irish saints have long been associated with wolves including Saint Patrick, Saint Colman, Saint Laisren, Saint Canice and others. Wolves were associated with the devil in Ireland and have taken the place of the snake in other cultures. Because wolves denned in the ground and the old Irish legends state that access to the underworld was through caves wolves were seen as denizens of both worlds and powerful as a result. So a saint or holy man who could talk to and negotiate with wolves was showing his power. However, some of the wolf encounters, or indeed their werewolf encounters, were very strange indeed. Saint Cormac was originally born near the mouth of the River Lee in Cork. He built a church and tower near the Silver River, County Offaly. Bizarrely, he initially spotted two black snails crawling up the side of the tower. Terrified, Saint Cormac jumped from the tower and ran away only for the snails to turn into wolves, chase him down and kill him. Everywhere a drop of his blood fell a well was created and this is how Saint Cormac's wells came into being.

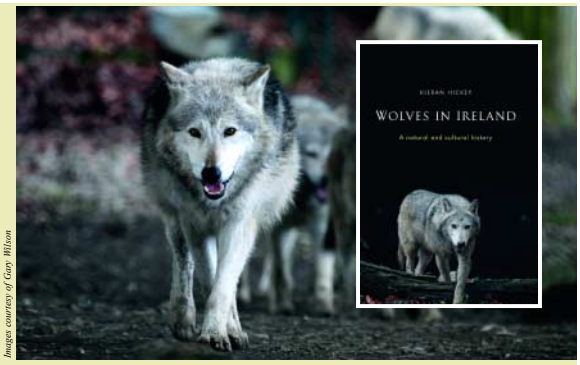
Other sources of wolf evidence include ogham stones, personal names, heraldic crests and family mottos, the Brehon laws, Irish myths and legends, modern day folklore as well as literary evidence.

The last wolf

Hunting of wolves was carried out by Robert Boyle, the Great Earl of Cork in the early 1600s on the Knockmealdown Mountains (Townshend, 1904). This area along with many others also has claims for the last wolf in Ireland with the last claim as late as 1770. The most reasonably reliable claim for the last remaining wolf is in 1786 and comes from Mount Leinster on the border of Carlow and Wexford counties. However at this stage there will never be absolute certainty on when the last wild wolf in Ireland died out.

The extermination of the wolf in Ireland

The first factor is fear, mostly from the new settlers in Ireland in the 1600's but the Irish too were very wary of wolves. This fear was due to a number of factors including their ferocious hunting reputation, their targeting of the old, the sick, the injured and the young – especially during famines and after battles. The eating of dead human and animal flesh, and their reputation for skulking around graveyards, also lent the wolf an unsettling air. An example of their scavenging activity followed the Battle of Bel-an-Chip in 1573 in the townland of Tawnaleen in County Galway, where wolves along with ravens, crows and birds of prey were recorded as eating the dead.



Images courtesy of Gary Wilson

Grey wolves at Dublin Zoo, 2011.

Group bonding; one of the core reasons why wolf packs are so formidable.

The bounties for wolves of the Cromwellian era were very substantial and although it is impossible to make an exact comparison in modern day money some calculations can be carried out: the bounty for an adult female wolf was £6 or 560 euro in today's money; an adult male £5 or 460 euro; a hunting juvenile 40 shillings or 185 euro; and a cub 10 shillings or 47 euro. In this context, an interesting new record of bounty payments comes from the Council Book of the Corporation of Youghal from 1676 and shows that the wolves in this area were probably a problem to farmers. On the 29th of July 1676 it was ordered by the late Justices of the Assize that £3, 15s and 4d be paid by the Mayor of Youghal out of the town revenue towards the taking of wolves. Clearly wolves were being actively targeted in this area although it is hard to work out how many wolves this bounty represented and whether it included some of the hunting costs involved, which is likely. There was even the arrival of a few professional wolf hunters into Ireland.

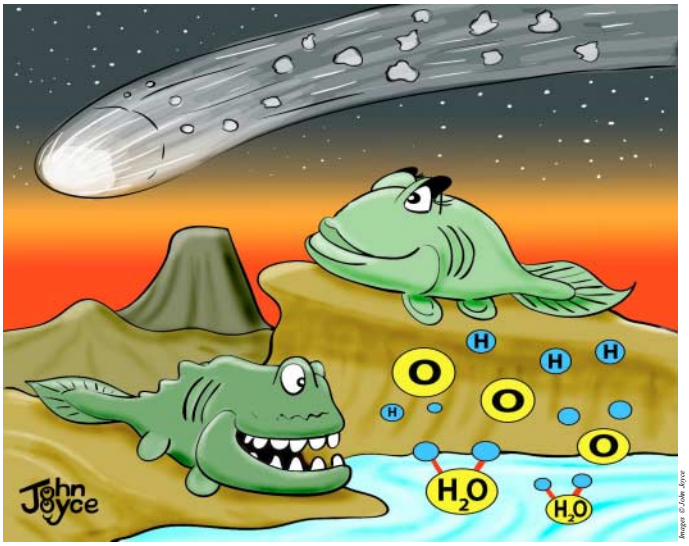
The radical reshaping of the landscape of Ireland from the 1600's onwards including extensive deforestation, drainage, creation of large estates would have put wolves under enormous pressure as areas of refuge and breeding sites would have diminished significantly. With the building of large houses on the estates they would have transformed the land to something familiar to what we know today but not reflective of the wildness of many areas in Ireland prior to the 1600's. Finally generally rising human population would also have added to the pressure on wolf populations. It is likely that wolves became isolated in pockets as there pressures grew and eventually each pocket whether through hunting or other pressures or inbreeding would cease to exist and eventually there were no pockets left apart from maybe a few stray individuals who lasted a little longer.

Final comments

The wolf is gone from the landscape of Ireland apart from a magnificent pack in Dublin Zoo. Whether that is a good or a bad thing is hard to know. The Ireland of today is a very different place to the last time wolves were around but nevertheless we must remember that our recent ancestors heard the howling of wolves on clear moonlit nights when sound travels furthest. They may have even caught a fleeting glimpse of them every now and again, especially those who lived in or near wilderness areas. The current, significant difficulties in re-introducing our recently lost birds of prey, such as the Golden Eagle, should make us think long and hard about the possibility of re-introducing the wolf back into Ireland, the last great land predator that we lost.

Kieran Hickey is a Lecturer in Physical Geography, Department of Geography, NUI Galway. His book, Wolves in Ireland: A Natural and Cultural History, is published by Four Courts Press
www.fourcourtspress.ie
Paperback, 2013.
ISBN: 978-1-84682-423-4
Price: €14.95

JUNIOR PAGES



Where did the Sea come from?

Some scientists believe that the water which now covers over 70% of our planet was formed here on Earth. This was thought to have happened when hydrogen (the small 'H' atoms in the cartoon on the left) in Earth's primal atmosphere reacted with the larger oxygen atoms (represented by the yellow 'O' atoms) found in oxides in our planet's crust to form molecules of water (H_2O).

According to this theory, water vapour then burst up through the crust of the Earth through volcanoes, cooled to a liquid and ran to the lowest point it could reach, forming lakes, oceans and sea. As it went, it took dissolved minerals from the rocks over which it flowed, which included the salts that make seawater salty (see below).

Other scientists are convinced that water was brought to this planet from outer space by water-rich asteroids and comets hitting its surface around 3.8 billion years ago in the form of ice. This is because the water molecules found on earth contain a special type of hydrogen atom called 'Deuterium' in the same ratio as water detected frozen as ice on comets and asteroids.

Why is the Sea Salty?

Over 200 years ago the French pioneer of modern chemistry Antoine Lavoisier suggested that the salt in seawater was 'the rinsings of Earth' and had been washed there from the land by way of rain, streams and rivers.

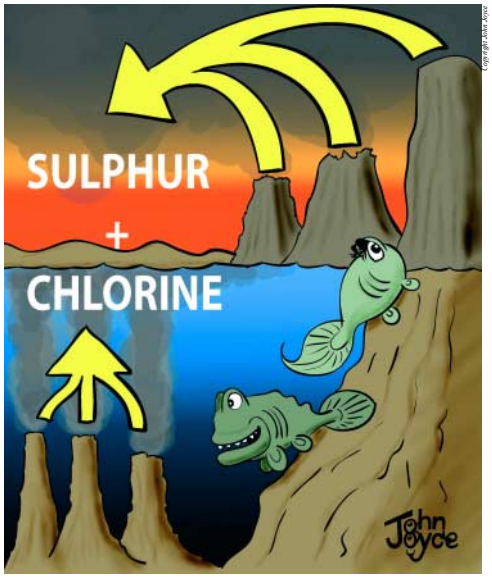
Modern scientists know that this is only part of the answer, since the salts in seawater contain high levels of sulphur and chlorine, which could not have come from simple weathering and must have come from volcanoes which spew out gases containing both chlorine and sulphur.

These volcanoes occur not only on land, but deep under the ocean where the great 'tectonic plates' of solid rock that cover our planet meet. Seawater flows down between these plates, is heated under pressure to well above boiling point and spews back out into the ocean, taking rich amounts of minerals such as sulphur and chlorine with it.

by John Joyce

For more Fun Facts check out www.spindriftpress.com

Why are there 'Seven Seas'?



Today our planet has what are called the 'Seven Seas' or oceans – the North Pacific, the South Pacific, the North Atlantic, the South Atlantic, the Indian Ocean, the Southern Ocean (around the South Pole, and the Arctic Ocean.

As long ago as 1596 the Flemish map maker and geographer Abraham Ortels, who created the first modern atlas of the world, suggested that the continents that make up the land mass of Earth were all part of one single land mass before drifting apart into their present locations. This theory was expanded upon by a number of other geographers who observed that the continents seemed to 'fit together' into a single landmass.

Then, in 1912 the German geologist Alfred Wegener made a presentation to the German Geological Society suggesting that millions of years ago there was only one ocean, surrounding a huge, single land mass or 'supercontinent' called Pangaea (meaning 'All Land'). His theory – known as 'Continental Drift' or 'Plate Tectonics' – was that this land mass, was sitting on a thin crust of solid rock above the molten core of the planet, like the chocolate around a cream-filled Easter egg. Over millions of years, the thin surface rock cracked apart along a number of 'seams' into a number of gigantic 'tectonic plates' the size of continents, which floated apart over some 200 million years.

Each 'seam' can be seen today as the mid-ocean ridges that form the boundary between each tectonic plate and are the sites of enormous mountain ridges and volcanic upwellings of molten rock many times longer and taller than any mountain range above water.

Learn about birds with BirdWatch Ireland

Feeding Wild Birds Leaflet
Download this leaflet from the Learn about Birds section on BirdWatch Ireland's website at www.birdwatchireland.ie

Learn how to identify the birds in your garden with our **Free Garden Bird Charts**. Send a SAE to: *BirdWatch Ireland, P.O. Box 12, Greystones, Co. Wicklow.*

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

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

- Visit the Working with Birds web site to learn about watching and feeding birds

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

BirdWatch Ireland, P.O. Box 12, Greystones, Co. Wicklow.
Tel: 01-2819878 Fax: 01-2819763
Email: info@birdwatchireland.ie

Website: www.birdwatchireland.ie

RINGING BIRDS

Have you spotted a ringed bird?

We can learn a great deal about birds by observing and counting them, but in order to investigate things like how long they live and where and when they move, we need to identify individuals. Ringing birds with light-weight colour and/ or uniquely numbered rings allows us to investigate the life-history traits of individual birds and to track them over time.

In general, bird ringing involves placing a metal ring on a bird's leg. While these rings are uniquely numbered, the inscription is very difficult, if not impossible, to read in the field, and so the bird must be recaptured in order to learn anything from it. However, the use of colour-rings negates the need to recapture birds, as these conspicuous rings can be read in the field using a telescope or a camera. This means that researchers and birdwatchers can identify individual birds numerous times with minimum disturbance to their behaviour. Some of the larger species (principally the geese) can be fitted with neck collars, as shown in the picture below.

Note the inscribed colour ring on the right leg of this Mediterranean Gull.

Some of the geese such as these Greylag Geese are fitted with neck collars – note A|AH & A|AA in this photo.

Where to report your ringed bird

If you come across a ringed bird, it might be from a scheme here in Ireland or in Britain. If you know what the species was, you may be able to track down the scheme yourself - check out the links on this page: http://www.birdwatchireland.ie/Birdwatching/Reportaringedbird/tabid/1309/Default.aspx for a full list of ringing programmes taking place in Ireland or others that include birds that occur here. Otherwise please consult the main Euring (www.euring.org) or Colour-Ringing (www.cr-birding.org) websites.

Text and images courtesy of BirdWatch Ireland

Sherkin Island Marine Station's

Environmental Competition for Primary School Children in Munster 2013

Sponsors: Dept. of the Environment, Community & Local Government; Bord Iascaigh Mhara; City Print; Cork City Council; Cork County Council;Evening Echo; Inland Fisheries Ireland; Janssen Pharmaceutical Ltd; Nature's Web (www.naturesweb.ie); Pfizer Ireland Pharmaceuticals; Sherkin Comment.

Native & Non-Native Species

MOST UNWANTED!

INVASIVE SPECIES

SINCE people began travelling around the world, they have intentionally or accidentally brought non-native species with them to other countries. These species are now travelling further than they naturally would, often finding themselves in new environments in which they are able to thrive. With few natural enemies and little else to stop them reproducing over and over again, they sometimes take over these new environments. Eventually, if they are not stopped, they can totally dominate large areas, destroying habitats that are really important for native species, and sometimes destroying the native species themselves. These species are known as invasive species. In Ireland, there are a number of organisations working together to help identify and locate these invasive species, as well as finding ways to limit their impact. Check out www.invasivespeciesireland.com and www.invasives.biodiversityireland.ie and www.fisheriesireland.ie/Invasive-Species/invasive-species.html. The four species below are just a sample of the invasive species threatening Ireland's native species:

American Grey Squirrel

Image courtesy of Robbie Murphy

ORIGIN: North America. Six pairs were brought from England and release in Co. Longford in 1911.
FIRST IRISH RECORD: 1911
FOUND: Prefers mature woodlands, but also found in urban and rural areas.
IMPACT: Threatens the native Red Squirrel as they out-compete them. Can damage woodlands.

Rhododendron

Image courtesy of Robbie Murphy

ORIGIN: Native to Europe and Asia (Spain & Turkey) and came to Ireland as a garden plant.
FIRST IRISH RECORD: Not known
FOUND: Found in gardens and forests throughout Ireland.
IMPACT: Rhododendron form dense growth, making it hard for native plants to grow. Also produces toxins which are poisonous to herbivores.

Zebra Mussels

Image courtesy of USGS

ORIGIN: Spread from the Caspian Sea into Europe in 17th century. Thought to have come into Ireland from the UK or the Netherlands on boats.
FIRST IRISH RECORD: 1997
FOUND: Marine habitats, in many northern and western freshwater systems in Ireland.
IMPACT: Eating food of native species, changing native ecosystems, blocking water intake pipes and boat motors.

Japanese Knotweed

Image courtesy of Robbie Murphy

ORIGIN: Asia
FIRST IRISH RECORD: Not known
FOUND: Along watercourses, transport routes and waste ground.
IMPACT: Has no natural enemies. A strong, rapidly growing plant that outcompetes native plants. Causes damage to tarmac and concrete and can act as a barrier in the movement of wildlife.

What is the difference between Native and Non-Native Species?

Images courtesy of Robbie Murphy

Fuchsia, also a common sight in Irish hedgerows, is a not native to Ireland. It was introduced here from South America and has now naturalised.

WHEN the ice began to melt 10,000 years ago, following the last Ice Age, animals and plants migrated over landbridges from the rest of Europe. As the sea levels rose, Ireland was soon cut off and the species of animals and plants that then existed here became known as native species. Some of these species, such as the giant Irish deer and the wolf, died out over time, but others survived. Today, species native to Ireland include badger, hedgehog, red deer, otter, Irish oak, birch, hazel, elm, dandelion, buttercup, bluebells and foxglove, to name but a few!

Hawthorn is a species that is native to Ireland and is a common sight in Irish hedgerows.

When man arrived in Ireland, he started to bring with him animals and plants from other parts of the world. Many of these species have since become established here and are known as non-native species. This list is long but includes sycamore, fuchsia, mink, grey squirrels and brown rats. Many non-native species have lived happily alongside our native species, however that is not the case for all of them.

GAISCE is in Business

TESCO

The proud Awardees and supporters.

GAISCE – The President's Award which was established by the Government in 1985 as a challenge to young people aged fifteen to twenty five to set and achieve goals for themselves has now extended into business for the first time. Recently the very first Gaisce Awards were presented to seventeen Tesco staff trainee managers through their Options Career Development programme.

The Awardees from right around the country were honoured at a special ceremony and lunch in Dublin's Gresham Hotel where the Bronze medals were presented by Gaisce CEO Anna Coyle and the Bronze certificates, signed by President Higgins, were presented by Geraldine Casey, Tesco's Operations Director.

Addressing the audience of Awardees, family, friends and Tesco's President's Award Leaders (PALs), the Personnel and Business Change Director of Tesco, Geoff Byrne, stated 'We encourage and believe in self-development and in helping our people develop themselves as individuals and as members of their communities. And that is why we are delighted to be a fully committed supporter of the Gaisce programme.' Geoff continued 'Like Gaisce we encourage our colleagues to set their own personal goals. Gaisce is about your own personal challenge in four different areas of activity.You are not competing against anyone but yourself – it's your own journey and development.We want our colleagues to be proactive ambassadors in local communities. We work tirelessly with hundreds of communities across Ireland. This is why Tesco and Gaisce fit. Community is at the heart of what we both do.The Gaisce programme is a very practical way of demonstrating the resilience that is required on an everyday basis and you have all learned a lot about this over the past year.'

Examples of the activities undertaken in the four areas of activity are as follows:

Community Involvement: Assisting with meals on wheels, helping in a nursing home, acting as a football coach, volunteering in a charity shop, helping in a community centre, being a youth leader, creche assistant.

Personal Skills: Developing communication, planning, organisational and team work skills in the Options programme.

Physical Recreation: Keeping fit through participation in handball, fishing, gym, football, walking, golf swimming, triathlon, step aerobics and Zumba dancing.

Adventure: Probably the most challenging was the Adventure journey around the Wicklow Way in harsh weather conditions based at Knockree with hiking through Enniskerry and Glencree.

Many of these Awardees will go on now to do their Gaisce Silver Award while the great news has just been announced that a new batch of thirty seven trainees are commencing on their Bronze.This progression and wave of new entries will strengthen the programme and have a wide ranging influence on Tesco's impact in the Community Involvement element of the programme.

At the Award ceremony, John T. Murphy, Director of Development with Gaisce said: 'This has been a strong start and a milestone in many ways for our relationship with Tesco and with a foundation like this the Award will prosper within for a long time to come.We would particularly like to thank Nuala Murphy who has acted as the overall Programme co-ordinator within Tesco for the participants and their personnel managers and also Marion Irwin-Gowran of Gaise for the valuable training provided for Tesco's President's Award Leaders.'

Images courtesy of Gaisce the President's Award

Tesco Operations Director, Geraldine Casey, Bronze Awardee, Lauren Ryder from Bray, Co Wicklow and Anna Coyle CEO, Gaisce – The President's Award.

The Awardees are: Geoff Atkinson, Dainis Bergmanis, Jonathan Cannings, Mark Drew, Karen Finnegan, Laura Hayden, Chris Heeney, Shauna Hyland, Shane Kennedy, Craig Lancaster, Emma Jane Lowe, Rachael McGrath, Paul McLoughlin, Shane McLoughlin, Sarah Louise Murphy, Niall Prendergast and Lauren Ryder.

For more information on the Award programme see www.gaisce.ie

Geoff Byrne, Tesco Personnel and Business Change Director addressing the audience.

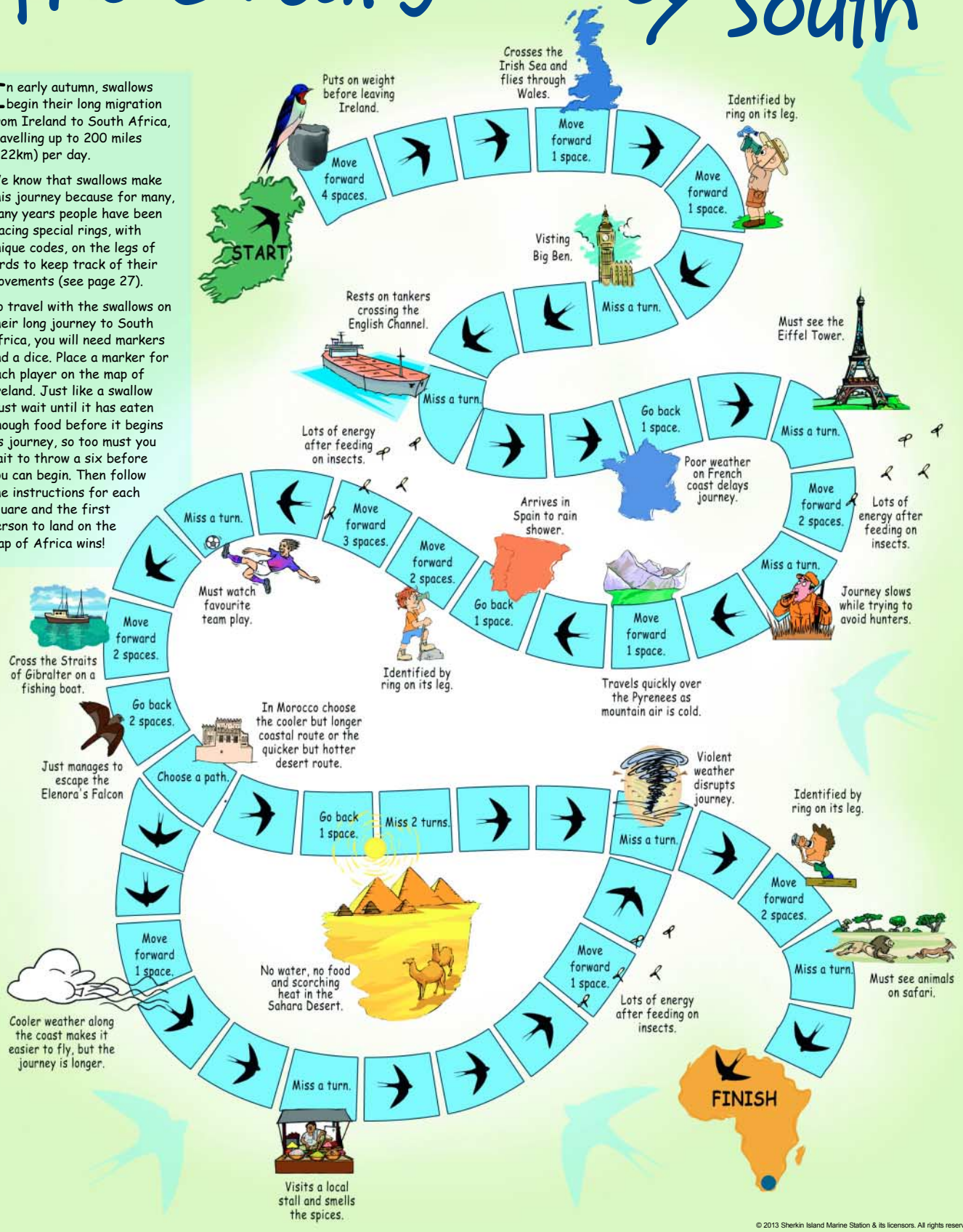
The Bronze medals and certificates.

The Great Journey South

In early autumn, swallows begin their long migration from Ireland to South Africa, travelling up to 200 miles (322km) per day.

We know that swallows make this journey because for many, many years people have been placing special rings, with unique codes, on the legs of birds to keep track of their movements (see page 27).

To travel with the swallows on their long journey to South Africa, you will need markers and a dice. Place a marker for each player on the map of Ireland. Just like a swallow must wait until it has eaten enough food before it begins its journey, so too must you wait to throw a six before you can begin. Then follow the instructions for each square and the first person to land on the map of Africa wins!



Understanding Our Oceans

By Mike Ludwig

WE are slowly expanding our knowledge about the nature and functions of the open oceans of our world. But although they cover about seventy percent of the earth's surface we remain disappointedly ignorant of what happens beneath their surfaces. In much of those waters we know more about the topography than how it and the water are used by living aquatic resources. What are the ecological functions and values of a site that draw species to it or how those attributes support organisms once they get there? We have learned recently that there are resource congregation points in virtually every ocean. Fish seem to find these areas important. They return year after year, but why? What makes a place a congregation site? Sometimes we can see that it has to do with the physical characteristics of the site. Currents create unique habitats and food may be more readily available. But more often than not there are no clearly identifiable attributes acting to lure or retain a species at a site. We need more information. This is particularly true for some of our most sought after and prized finfish species. Tunas, sharks, swordfish and billfish are considered highly desirable but they are also highly migratory. They travel widely throughout their lifecycles. Tagging and satellite tracking some of these species such as individual Atlantic bluefin tuna is beginning to reveal their habits and activities during their travels. But these more closely investigated species are in the smallest of minorities. Collecting long-term data and the growing difficulty in obtaining sufficient research dollars to undertake studies typically means that only the most important or valuable species get this elevated level of study. Bluefin tuna is the most valuable species swimming in the open ocean because of its use in ethnic foods, particularly as raw flesh and its disappearing from our oceans. It gets very special attention.

Of increasing interest is another species that travels widely and has particular importance to the recreational fishing community; the Atlantic salmon. Their continued decline in numbers and use of rivers for spawning reflects their shrinking numbers and range. Without a definitive explanation for the decline, theories abound but virtually all of them lack the support of hard facts. For instance we are releasing millions of juveniles from coastal hatcheries but the number that return to the home rivers do not support the continued use of the practice. So, after forty-five years of attempting to restore Atlantic salmon to the Connecticut River at an annual cost of several million dollars, failure was accepted and the restoration program shifted to other species. However, why the fish didn't return remains an unanswered question. Some areas can point to salmon farming as a source of disease and parasites that can attack juveniles traveling to sea past the farms as they move offshore for their maturation. However, the Connecticut River stock did not have any salmon farms to pass. The fish went to seas as healthy "smolt" (the lifestage that migrate to sea) and simply disappeared. One explanation of the problem is that hatchery reared fish are dumber than wild fish. Because hatchery fish don't experience the natural threats to life until they leave the hatchery the juveniles are ill prepared to meet life's challenges. The problem with that is that most of the natural deaths in a fish's lifetime occur during their earliest lifestages. Eggs sitting on the bottom, larval an juvenile fish in the water column are subjected to natural forces from water temperatures, storms and droughts as well as predation by predatory species that can account for complete loss of all the individuals spawned in a single year. It is typically held that only about 10 percent of a spawn live to migrate to sea. One in ten individuals is pretty bad odds. Hatcheries can improve the survival to migration rate to more than 50 percent!

It has always been important to realize that even though the average fish may produce thousands of eggs per spawning event only two from all the fish's reproductive efforts throughout its life have to survive and grow to maturity to maintain a population at its current level. What happens to all the others that don't survive is immaterial because we have the two survivors sustaining the population. However, with more and more people seeking relatively inexpensive and nutritionally beneficial fish, we need each surviving pair of fish to produce more and more young that survive to maturity so that they can reproduce more and more future population members. But, which are the chosen pair and how does one protect them when they leave home? And, if a population is declining, how has one or both of the two replacements failed to survive and grow to maturity? Just as we worry about our children going out without a way to contact us for help or guidance scientists are or should be asking; how can we help our fish survive in the world beyond the home river or hatchery door? We need to know what is causing species such as Bluefin tuna and Atlantic salmon to decline in order to enable us to stabilize or increase their populations and insure our fishing enjoyment. Hey, we spent millions cleaning up the ocean and rivers. It seems silly to now see that the waterways are cleaner but empty of the very resources we worked so hard to provide for them.

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