

SHERKIN COMMENT

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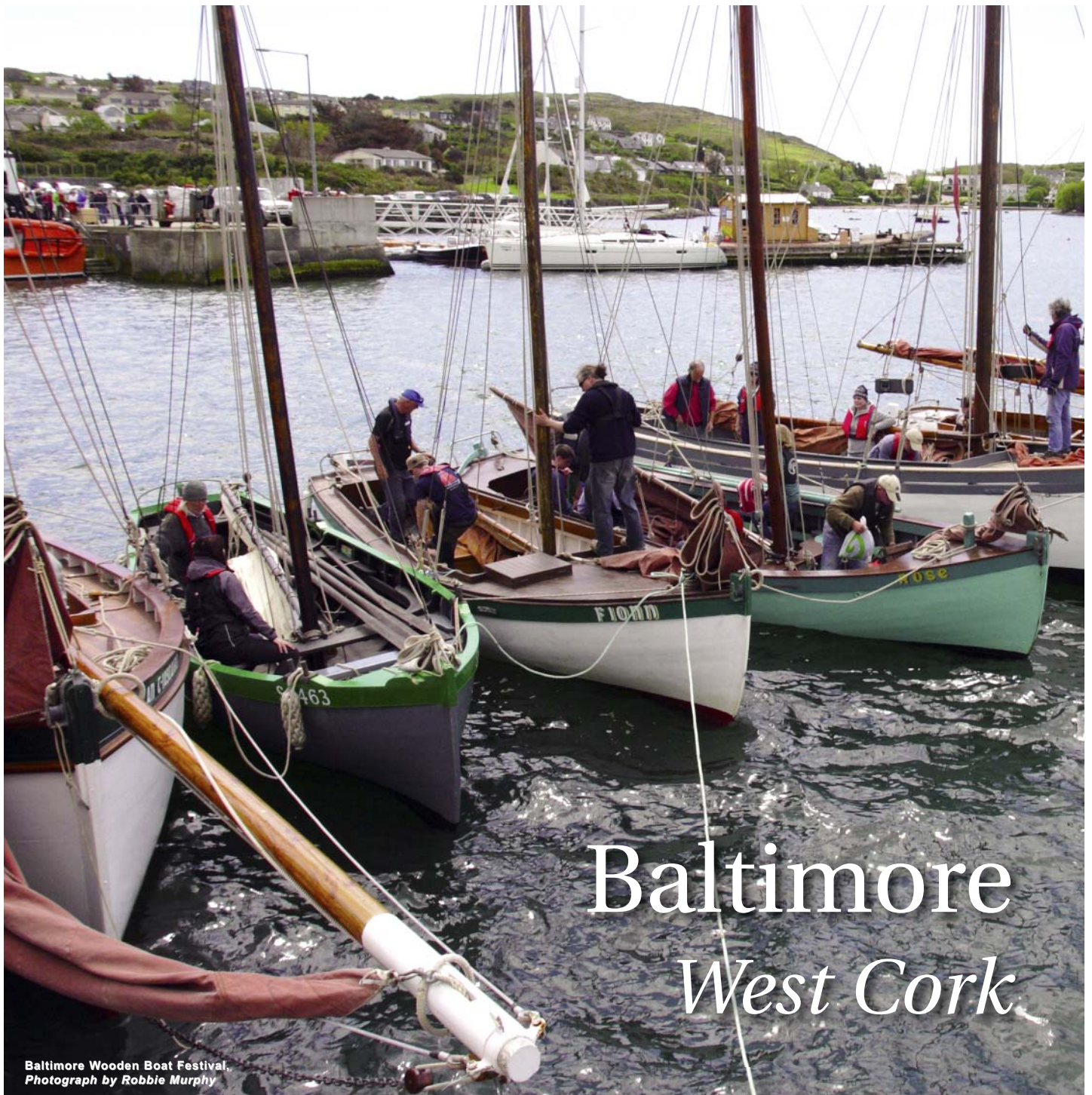
2015

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Photograph by Robbie Murphy

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Editorial

Waste Not Want Not

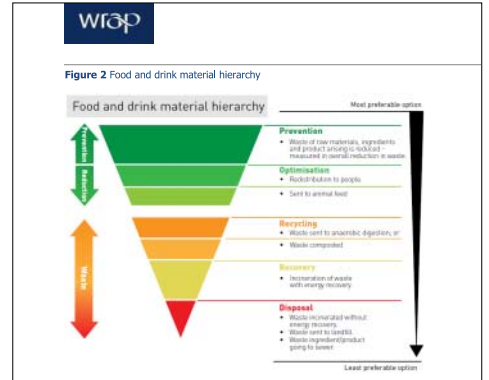
By Matt Murphy

MUCH has been written about the Climate Change gathering in Paris. Though countries will commit themselves to reductions in CO₂ over the coming years, governments will change and reasons will be found to “adjust” the commitments given in Paris. However, we shouldn’t be waiting for governments to make all the changes. As individuals we can make a major contribution to the future of the planet by reducing waste. It is much simpler than one would think. For example, what if everyone just reduced the mileage we drive and the electricity and gas we use by just 5 percent? A huge area of waste in many households is food waste. In *Sherkin Comment* No. 52, we featured an article on the STOP Food Waste Campaign (www.stopfoodwaste.ie) and if their suggestions were applied in Irish homes, it would make a very positive contribution to the environment.

Recently I read a report by WRAP (Waste & Resources Action Programme), a registered charity in the UK that helps businesses, individuals and communities to reduce waste, develop sustainable products and use resources in an efficient way. They published the results of three major studies carried out in 2013, which estimated annual food (and drink) waste arising within UK households, hospitality and food service, food manufacture, retail and wholesale sectors at around 12 million tonnes, 75% of which could be avoided. The value of this is over £19 million sterling a year (€27 million). This was associated with at least 20 million tonnes of greenhouse gas emissions. Around 90% (by weight) of the avoidable food waste comes from households and food manufacture. A further 3 million tonnes of food waste comes from other sectors in the UK. This includes estimates for other food thrown away by consumers out of home (e.g. home-made lunches at work, as litter, in litter bins and the pre-factory gate stages of the food chain).

This results in an estimate of 15 million tonnes of food waste arising in the UK each year (see figure 1). In comparison around 41 million tonnes of food are purchased in the UK each year, the majority for home use. This means that food wasted throughout the supply chain is equivalent to around a third of that purchased. In addition to food waste there are also 2.2 tonnes of food or food by-products from food manufacturing used as animal feed and another 2 million tonnes of animal by-products sent to rendering plants. The key findings are:

- The UK has had large-scale interventions in place since 2007 aimed at reducing food waste across food supply chains and within households. This contributed to a reduction in post-farm-gate food waste between 2007 and 2012 of around 12% or 1.6 million tonnes.
- WRAP suggest that by the end of 2015 the reduction in food waste could amount to 2.0 million tonnes year compared to 2007, preventing around £4 billion (€5.7 billion) worth of food being waste in 2015, and saving around 7.0 million tonnes of CO₂ emissions.
- A reduction of 30% by 2025, from 2007 levels (when the UK ramped up efforts to decrease food waste), could be achieved but would be extremely challenging. The actual level of reduction is influenced by factors such as population levels, global economic conditions and food prices, in addition to the



- levels of interventions aimed at supporting food waste reduction.
- There is a lack of data and research to accurately estimate the full social, economic and environmental costs and benefits of food waste reduction. However, the evidence available suggests that between 2015 and 2025 around 20 million tonnes of food waste could be prevented.
 - This would prevent €30 to €40 billion (€43 to €57 billion) of food being wasted over the 10 year period (at present values), and avoid 60 to 70 million tonnes of CO₂ emissions being generated.
 - The costs of achieving this could range from between £200 million and £530 million, over the 10 year period from 2015.
- For further information on WRAP check out www.wrap.org.uk.

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

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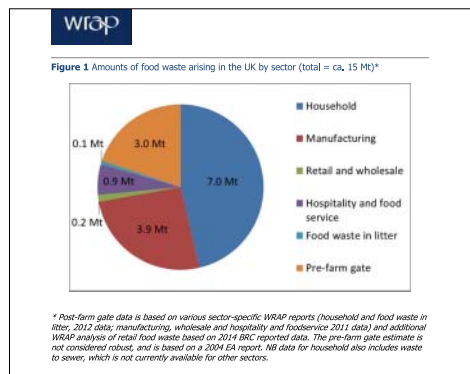
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By Oscar Merne

OYSTERCATCHERS are obvious (no alliteration intended). They are big, bold and black-and-white, and also quite noisy. I won't use the term "brash" as that suggests "attitude" and might be a bit anthropomorphic. On our shores, the non-birdwatching public can hardly be unaware of their presence, unless totally unobservant of nature around them or absorbed in their smart phones or MP3s.

They are common on all shores, and in many places flight up to several kilometres inland to feed in short grass areas such as playing fields and tight-cropped sheep-grazed pastures. They do this particularly when the tide covers their coastal feeding sites, and when the ground is soft enough for them to probe for earthworms with their long beaks. Incidentally, one of the down-sides of feeding on sheep-grazed pastures is that many Oystercatchers tangle their toes in the fine filament of sheep wool fibres, which cause deformities and even amputations in severe cases. However, the birds seem to manage and many live to a ripe old age (up to 36 years 9 months!).

In spite of the name, Oystercatchers do not eat oysters. Rather, they much prefer bivalves such as cockles and mussels, and also marine worms. They are also adept at taking limpets by surprise, and with a deft sharp tap of the bill, knocking them off their hold-fast places on the rocks. I once found an Oystercatcher nest carefully lined with up-turned used limpet shells: the problem was that this could be seen with the naked eye at 100 m against the dark stones of the beach and lacked the normal cryptic camouflage of nest and eggs that protect from ground and aerial predators.

In Ireland, Oystercatchers breed almost entirely on the coasts, but are rather scarce on much of the Cork and Waterford coasts, and also on parts of the east coast. This breeding population has been estimated at c.3,000–4,000 pairs. There are far more (perhaps up to 50,000 pairs) breeding in Scotland and northern England, and there a large proportion of the birds breed inland.

Considering its vast breeding range, from Iceland and Ireland in the west to Kamchatka and Japan in the east, Oystercatchers are not particularly abundant. Their total population may not exceed 1,250,000 birds.

In winter, our migrant immigrants seem not to be very long-distance travellers. The great majority probably come from neighbouring northern Britain, but some also travel from Iceland (from up to 2,000 km away), the Faeroes, and also SW Norway. Populations from other parts of Eurasia migrate further, but seldom cross the equator.

The Irish non-breeding population of Oystercatchers is estimated to be c.26,500–28,500 birds, but with so

OYSTERCATCHERS

The Pipers of the Shore



The Oystercatchers found in Ireland are the Eurasian species *Haematopus ostralegus*. They breed almost entirely on the coasts, with an estimated breeding population of c.3,000–4,000 pairs.

many scattered along shores outside the main concentration areas, this may be an underestimate. By far the most important site in Ireland is Dundaik Bay, which has >4,000 ha of intertidal flats with a very high biomass of cockles and other bivalves and marine worms that the birds feed on. The first census carried out there in the 1970s came up with 25,000 Oystercatchers, but this was probably due to the 5.0 m tides moving large numbers along the shore and resulting in duplication of counting. Nevertheless, a long series of monthly counts (carried out by myself), commencing in the mid-1980, produced a peak of over 15,000 birds, with averages of 11,000. I recall the peak, comprising one dense flock of Oystercatchers feeding along the tide-line from the mouth of the Castletown River to Annagassan, a distance of 15 km! Other important sites in Ireland include Loughs Foyle and Swilly (Co. Donegal), Dublin Bay and Rogerstown Estuary (Co. Dublin), and Cork Harbour, all of which support 2,000–4,000 birds.

Our Oystercatchers are the Eurasian species *Haematopus ostralegus*, and are one of eleven species in the genus. These have a global distribution, but a couple have an extremely limited range – for example the Chatham Oystercatcher is confined to Chatham Island, east of New Zealand, and is endangered. The Canarian Black Oystercatcher, now extinct, was confined to the Canary Islands. The Magellanic Oystercatcher is confined to the southern tip of South America, from c.45° S to Tierra del Fuego. However, the others are more generally distributed in both the New and Old Worlds.

In my travels I have seen most of these (obviously not the extinct Canary Islands birds, nor have I been to Chatham Island). Morphologically and behaviourally, the oystercatchers seem to be very similar and are probably very closely related, in spite of huge geographical separation of the species. They are either pied or all black, have long, orange bills and pink legs. The amount of white on the rear of the wings seems to be the main difference between the pied species, while the colour of the iris and eye-ring is red or yellow. I haven't checked up on recent mitochondrial DNA studies but would be surprised if they did not find that the genetic relationships are close.

Having lived by the sea for most of my life I feel an affinity for the shore, and find a comfort in the ever-presence of these "in-your-face" and noisy birds that share the coastal environment. It would be a poorer place without them.

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

Images courtesy of Cam Merne



AN IDEAL GIFT: A *Beginner's Guide to Ireland's Seashore* – @ €7.00 (plus p&p €1.00)
& A *Beginner's Guide to Ireland's Wild Flowers* – @ €7.50 (plus p&p €1.00) – see page 29 for details.



Zoological Specimens from the Challenger Expedition 1872–1876 at the National Museum of Ireland

FROM THE 19TH CENTURY'S DEEP OCEANS TO PRESENT-DAY'S DIGITAL AGE

By Sylviane Vaucheret

SINCE March 2009, the National Museum of Ireland has undertaken an inventory of its collections, across the four sections of the Museum (Art and Industry, Irish Antiquities, Irish Folk-life, Natural History). A centralised database is being created where the information relating to each object or specimen from the Museum collection is compiled in a unique record.

During this Inventory Project, about 1,000 zoological specimens collected during the Challenger Expedition 1872–1876 were catalogued and have recently been made accessible online.

The Challenger Expedition and the Origin of Modern Oceanography

The Challenger Expedition – named after the vessel *H.M.S. Challenger* – should be considered in the wider context of other famous British marine expeditions, such as those of James Cook (late 18th century) and of Charles Darwin's travels on *H.M.S. Beagle* (1831–1836).

By the 1850s, all of the main landmasses and most of the minor ones had been discovered. However, nothing was known of the nature of the deep sea. It was commonly accepted that this environment could be defined by darkness, high pressure and intense cold, and could not possibly support any form of life.

This position came into question following the publication of *On the Origin of Species by means of Natural Selection* by Charles Darwin in 1859, which led to some speculation that life in the deep ocean was possible.

Separately, the recent invention of the telegraph instigated the necessity to connect continents with submarine, telegraphic cable:

"There can be no doubt that the invention of ocean telegraphy first stimulated the great desire as well as the necessity for a knowledge of the contour of the bed of the ocean. To insure success it was essential to know the configuration and the soundings of the sea, the shape and character of its bed, the nature of the creatures and plants that haunt its depths, the force and set of its currents, the figure and dimensions of the great ocean basins, and the temperature of the water at various depths." (Spry, 1878)

This provided a commercial impetus for the study of the deep ocean.

The Challenger Expedition was therefore the first ever to be commissioned with the express purpose of studying the physics, chemistry, geology and biology of the deep ocean and is considered by many to be the origin of modern oceanography (figure 1).

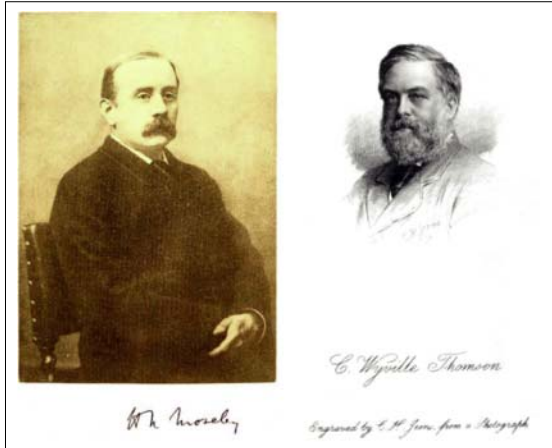


Figure 1: Portraits of H.N. Moseley, Naturalist and Prof. C. Wyville Thomson, Director of the Civilian Staff on the *H.M.S. Challenger* (sources: Moseley, 1892 and Wyville Thomson, 1878)

The Scientific Work On-Board *H.M.S. Challenger*

H.M.S. Challenger left Portsmouth in December 1872 and returned to Spithead, Hampshire in May 1876 having spent over three years circumnavigating the globe. In total, 362 official stations were established where numerous measurements were made and samples – including biological ones – were taken.

From a human point of view, the repetitiveness of stopping at stations and carrying out all these measurements, very rapidly wore off, especially for the sailors who had little stake or interest in the science behind them (figure 2). Almost a quarter of the 261 sailors originally on board left or deserted at the various ports of call.

Why are "Challenger" Specimens in the National Museum of Ireland?

On the expedition's return, a "Challenger Office" was established in Edinburgh to collate the data, dispatch the samples to experts and supervise the publication of reports. At first it was expected that all could be published in 15 volumes within about 5 years... Eventually 50 large volumes were published, the final two in 1895. More than 4,000 species new to science were described and named in one or another of the 50 volumes.

Most of the zoological specimens were sent back to the British Museum, including all the "type specimens" referred to in the published reports. A type specimen is an individual zoological organism or a group of organisms, which is used to describe and name a new species. However, not all of the type specimens from the Challenger Expedition were clearly marked as such.

On the 24 June 1899, Ray

Lankester, Director of the British Museum wrote to Dr Scharff (Museum of Science and Art, Dublin – now the National Museum of Ireland):

"The "Challenger" duplicates have hitherto been reserved for exchange against deep sea specimens required for our collection, but henceforth they are to be regarded as ordinary media of exchange. It occurs to me that you might like to take this opportunity of improving your collections, and I should be glad to allow you to make selection from the "Challenger" duplicates on the condition that at the first opportunity you make us a suitable return." (Wheeler & O'Riordan, 1969)

Staff from the Dublin Museum duly visited the British Museum to select specimens amongst the "duplicates", unaware that some of these happened to be unmarked type specimens. As a result, not only does the National Museum of Ireland hold a very large collection of historically important "Challenger" specimens, it also holds a surprising amount of the scientifically significant type specimens from the famous expedition. The specimens in the Museum belong to a wide range of species from the main invertebrate taxonomic groups, as well as some chordates and fish.

The Use of Digital Technology to Improve Access and Visibility

The specimens from the Challenger Expedition arrived at the Museum in Dublin with a limited amount of information, usually hand-written, on individual labels (figure 3).

As part of the Inventory Project, this information was captured on digital database records. Subsequently, a volunteer spent six months at the Museum checking and improving these records, cross-referencing



Figure 2: Illustrations depicting "Sifting Deposits" and "Bird Skinning" on board *H.M.S. Challenger* (source: Tizard et al., 1885)

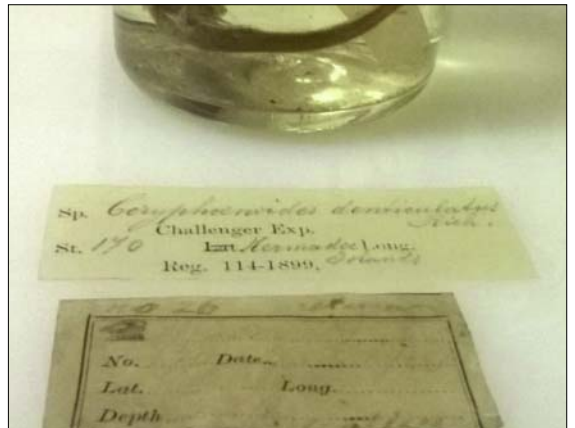


Figure 3: Thornthroat grenadier *Lepidorhynchus denticulatus* Richardson, 1846 (specimen NMNH:1899.114.704) showing National Museum of Ireland label (top) and older, faded label (bottom).

them with the corresponding published Reports of the Scientific Results of the Voyage of *H.M.S. Challenger* during the Years 1873–76. Station numbers were completed, when possible, with geographical localities, as well as dates, depth, method of collection and modern coordinates.

Digitising the information relating to these historical specimens has allowed the National Museum of Ireland to respond positively, in early 2015, to a partnership proposal with the Royal Albert Memorial Museum & Art Gallery (RAMM), in Exeter (UK).

Although various scientific institutions all over the world hold "Challenger" collections, this information is not readily available even to specialists. The RAMM *HMS Challenger Project* addresses this issue by regrouping on a single website the information relating to the samples collected during the Challenger Expedition, independent of their current physical location.

Readers are encouraged to check the website: www.hmschallenger.net

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With thanks to Laetitia Beschus for her work volunteering at the National Museum of Ireland from February to August 2014.

Ms Sylviane Vaucheret, Documentation Officer, Natural History Collections and Irish Antiquities Collections, National Museum of Ireland, Kildare Street, Dublin D02 FH48.

The Wild Plants of Baltimore, West Cork



By John Akeroyd

DURING nearly 30 years of visits to the Marine Station, I've regularly passed through or spent longer periods in Baltimore. This attractive little port, though just ten minutes across the Harbour from Sherkin, is botanically quite distinct from the islands – and its castle, harbour, streets, gardens and hinterland provide me with constant interest. I've found a number of special or rare plants here, absent from other parts of Roaringwater Bay. Part of the fun is tracking down the finds of botanists such as R.A. Phillips and Oleg Polunin who explored here – over 60 years ago. Sadly, some plants have disappeared such as Bird's-foot Clover (*Trifolium ornithopodioides*), which once grew on the pier.

I've frequently included botanical records from Baltimore in my publications on Roaringwater Bay (see note at end). Some years are better than others, but a number of species have turned up regularly over the last 20 years. Many are wayside weeds, the plants botanists call ruderals, from (Latin *ruderalis*, 'among rubbish'), often ancient medicinal herbs associated with human habitation. These ruderals have decreased in Ireland in recent years, partly due to a general growth of tidiness. My favourite persistent ruderal is Musk Storksbill (*Erodium moschatum*), an attractive low-growing weed with feathery leaves and delicate pink petals that often fall by early afternoon. It's on Sherkin but is something of a Baltimore speciality, growing along bases and tops of walls, and in pavement cracks near the craft shop. Other harbour plants include Sea Pearlwort (*Sagina maritima*), not at all

common in Roaringwater Bay, green-flowered Petty Spurge (*Euphorbia peplis*), scarce in the islands but here a weed of tubs and beds, and mauve-and-yellow Ivy-leaved Toadflax (*Cymbalaria muralis*) from the mountains of southern Europe, trailing from chinks of walls.

Inland, at the entrance to the town, The Glebe gardens – worth visiting for homemade soup or cakes – have yielded many treasures, even among the vegetables, such as feathery-leaved Common Ramping-fumitory (*Fumaria muralis* subsp. *boryi*), Cut-leaved Dead-nettle (*Lamium hybridum*) and the similar Field Woundwort (*Stachys arvensis*), a decreasing weed of tillage scattered in Roaringwater Bay. In undisturbed shady corners lurk two West Cork rarities, Henbit Dead-nettle (*Galeopsis bifida*), disappearing across western Ireland, and sprawling, violet-flowered Bittersweet or Woody Nightshade (*Solanum dulcamara*), also at one place on Heir Island.

But the plants on the castle mound above the harbour comprise the real jewel in Baltimore's botanical crown (appropriately so, as the castle

is Dún na Séad, or Castle of Jewels!). The mound, a pocket of relict seaside grassland, is bright in early summer with pink-flowered Kidney-vetch (*Anthyllis vulneraria* subsp. *lapponica*), Oxeye Daisy (*Leucanthemum vulgare*), yellow-flowered Bird's-foot Trefoil (*Lotus corniculatus*) and native purplish-pink Red Clover (*Trifolium pratense*). Another group of plants here – a veritable museum of old medicinal herbs – includes two wild mallows once valued for the soothing mucilage in their leaves – bushy Tree Mallow (*Lavatera arborea*), native on cliffs and rocks but also a cottage garden plant, and Common Mallow (*Malva sylvestris*), now rare and mainly coastal in West Cork – together with two others associated with old buildings, Pellitory-of-the-Wall (*Parietaria judaica*) and stately Great Mullein (*Verbascum thapsus*). Perhaps the most distinctive plant is Alexanders (*Smyrnum olusatrum*), with winter-green, glossy leaves and yellow umbrella heads of flowers in the spring. This old potherb, thought to have come back from the Mediterranean with Crusaders, also grows by The Cove and a new car-park

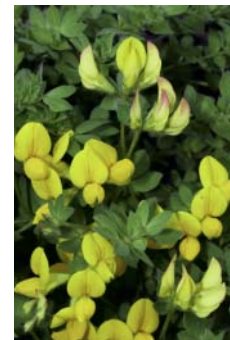
towards the top of the village. It occurs too on Sherkin, by the Friary and the Castle, and by Rincolisky Castle near Lisheen. More curious is Calamint (*Clinopodium ascensens*), again probably a medicinal relic (like mallows and mulleins, used to treat coughs), mint-like with pale mauve flowers from summer to autumn. Nobody seems to have recorded this Irish rarity before myself, though older records exist for the closely related Clary (*Salvia verbenaca*). I suspect someone made a mistake and botanists copied from books while failing to check in the field – or perhaps both were formerly present! To add further confusion, another related species, Wild Basil

(*Clinopodium vulgare*), a pink-flowered mint usually found in lime-rich grasslands, occurs here as well.

In open ground by the castle steps grows an assortment of annuals, such as slender Thale Cress (*Arabidopsis thaliana*), a tiny weed absent from the islands, and Hairy Tare (*Vicia hirsuta*), an old cornfield weed that persists on dry banks on Sherkin and elsewhere. In 2012 I found a classic Irish plant, Rayed Groundsel (*Senecio vulgaris* var. *hibernica*), new to West Cork but known for some 200 years from Cork City. Groundsel flowers usually lack yellow ray florets, looking like miniature shaving brushes. Another rocky patch, between the Church of Ireland church and main car-park, planted with flowers but still wild, holds another scarce Irish plant, scruffy prostrate Sand Spurrey (*Spergularia rubra*). This grew elsewhere but has now disappeared, although recently refound – after half a century – on Cape Clear, and a few plants survive in a layby on Turk Head.

I must mention too the wonderfully scented but invasive Winter Heliotrope (*Petasites fragrans*), flowering from October to March. Another rampant plant of overgrown places and hedges in Baltimore, though a native of West Cork coasts, is pink-flowered Hedge Bindweed (*Calystegia sepium* subsp. *roseata*), which grows also by the River Ilen and elsewhere in Roaringwater Bay. Too often overlooked, Baltimore's ruderal flora makes a special contribution to the flora of Roaringwater Bay and West Cork, and is a living link with the past.

Dr John Akeroyd is author of A Beginner's Guide to Ireland's Wild Flowers (2008), and edited The Wild Plants of Sherkin, Cape Clear and adjacent islands of West Cork (1996) and Supplement (2011), and The Wild Plants of Bere, Dursley and Whiddy Islands in Bantry Bay, West Cork (2013) for Sherkin Island Marine Station.



Top: Ivy-leaved Toadflax (*Cymbalaria muralis*); Middle (from left): Cut-leaved Dead-nettle (*Lamium hybridum*); Bird's-foot Trefoil (*Lotus corniculatus*); Musk Storksbill (*Erodium moschatum*). Bottom (from left): Great Mullein (*Verbascum thapsus*); Common Mallow (*Malva sylvestris*); Tree Mallow (*Lavatera arborea*); Dún na Séad Castle, Baltimore.

Dredging around Ireland

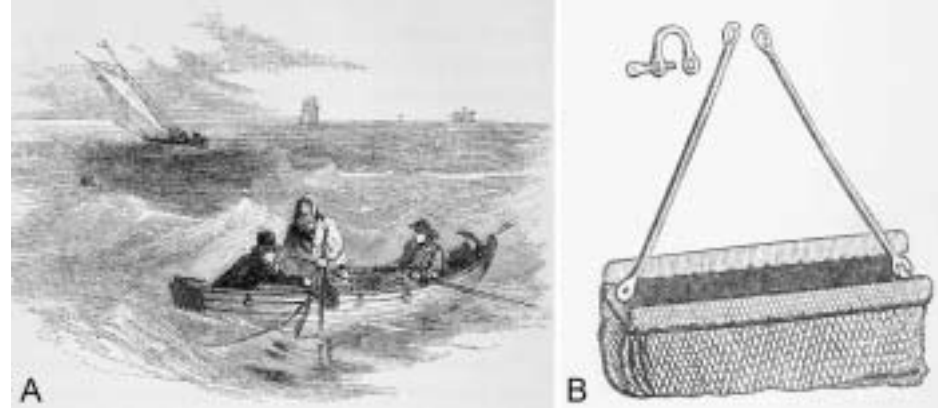
Over 200 years of marine surveys

By Patrick N. Wyse Jackson

SINCE the turn of this century a great deal of time and energy has been expended on exploration of the seabed around Ireland. Much of this effort is centred on the Government-funded programme INFOMAR (Integrated mapping for the sustainable development of Ireland's marine resource) [www.infomar.ie], run jointly between the Marine Institute and the Geological Survey of Ireland (GSI).

The results are remarkable, from the documentation and visualisation of numerous shipwrecks to the delineation of mountainous terrain in basins off the west coast. Mapping of sulphide-pumping vents around the mid-Atlantic ridge as well as mounds of the cool-water coral *Lophelia* in the Porcupine Basin and elsewhere demonstrate just how dynamic the seabed is, and what a rich fauna it supports.

It is tempting to suppose that our knowledge of the area around Ireland has only recently become available. This is not the case: there has been a long term fascination with Ireland's surrounding waters and



(A) Naturalists using the Dredge; (B) Ball's Dredge. [From William Henry Harvey *The Sea-side Book* (1849), pp. 116 & 117].

seafloor, and this is really not so surprising as we are an island nation situated on the fringe of continental Europe.

At various times in the 1800s the Dublin Society concerned itself with herring and other fisheries and published a number of reports. In 1825 the Scottish surveyor Alexander Nimmo (1783–1832) authored a seminal paper on the geology of offshore southern Ireland in the *Transactions of the Royal Irish Academy*. This was the first geological account of an area that in the 1960s was explored in great detail in the search for com-

mercially viable oil and gas wells. Nimmo got sea captains to retrieve samples of rocks and sediments from the seafloor and from this he mapped out their distribution.

The major expansion of marine research globally occurred between the early 1800s and the 1870s, when it could be said, the power of the British navy was at its greatest, and when coincidentally scientific research was being promoted by various learned societies. Other naval powers were also investing in marine science during these decades. The most ambitious expedi-

tion mounted was that of the *H.M.S. Challenger* which commenced in 1872. Under the direction of Charles Wyville Thomson (1830–82) who had been a professor at Queen's College, Belfast, this vessel traversed the Atlantic Ocean for nearly three years and brought back to Britain a vast hoard of biological and scientific treasures. The scientific community produced over 50 monographic reports on the findings, and specimens were distributed to many institutions where they remain important scientifically to this day.

In Ireland curiosity with the oceans and marine sciences was also aroused and maintained by various naturalists and societies. William Thompson (1805–52) and Robert Ball (1802–57) were two such naturalists. The former produced the magnificent *Natural History of Ireland* which documented many new species from Irish waters, while Ball is remembered for his painstaking work as Director of the Dublin University Museum. However, in the context of this article his greatest legacy has to be his invention in 1838 of the 'Ball Dredge' a device for collecting marine organisms that found immediate favour (see above) and which remained in use until the early twentieth century.

The British Association for the Advancement of Science which was established in 1831 met annually in a British or Irish city where cutting edge research was reported on and discussed. Studies were encouraged through the establishment of committees and the awarding of grants. The Committee on Dredging saw local committees engaged in Ireland in the 1850s: George Crawford Hyndman (1796–1867) was a

mainstay of the work in and around Belfast while from Dublin reports were transmitted by the medic John Robert Kinahan (1828–63). Later in the first decade of the 1900s the Ulster Fisheries and Biology Association and the Dublin Bay Dredging Committee continued this research theme.

In 1885 the Royal Irish Academy appointed a committee to investigate the Irish marine fauna and that year surveyed Bantry Bay from the vessel the *Lord Brandon*. This enterprise owed much to the expertise of the Rev. William Spotswood Green (1847–1919) the Rector of Carrigaline, Co. Cork whose fisheries and mountaineering interests were to take him out of the pulpit to devote his life elsewhere. In the immediate years following the success of 1885 deeper waters off southwest Ireland were dredged and later in 1896 a courageous expedition steamed to Rockall.

The Royal Dublin Society convened a Fisheries Committee in 1887 which carried out a number of surveys, and it eventually metamorphosed in 1900 into a government-funded Fisheries Branch headed up by Green that yielded considerable information on Ireland's offshore. This included some reports on the geology of the basins off Co. Kerry.

Today it is easy to observe the structure of Ireland's seabed simply by viewing Google Earth. However, it is worthwhile remembering the considerable research carried out by previous generations of marine biologists, geologists and scientists whose accumulation of data has allowed their modern counterparts to take their research further than they could have imagined. Each generation works to the limit of available technology to produce high quality research, and the pioneers such as Ball, Green, and Nimmo were no exception, and no doubt the same will be said in years to come of the work of INFOMAR.

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PAGE 29: Answers to "REDUCE, REUSE & RECYCLE"

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Resurrecting the Hudson River

By Walter Mugdan¹

October, 2015

STARTING in the mid-1940's the Hudson River, long fabled for its beauty, became the sewer for more than a million pounds of toxic chemicals. Polychlorinated biphenyls PCBs, classified by the U.S. Environmental Protection Agency (EPA) as a probable human carcinogen were used from 1946 to 1977 by the General Electric Company (GE) at two plants located in the towns of Fort Edward and Hudson Falls, some 200 miles north of the Hudson's mouth in New York City.

Both plants discharged PCB wastes directly into the river. When a nearby dam was removed in 1973, mud laden with PCBs surged down the river. Most settled in the next lower reach of the river, behind another dam, but some of the chemicals made their way downstream all the way to New York Harbor.

PCBs are taken up by tiny plants and animals plankton and bioaccumulate up the food chain into worms, shellfish, fish, birds (including ospreys and bald eagles) and mammals (such as otter, mink and humans). To protect people at the top of the food chain, the Hudson was largely closed to fishing for human consumption, including the commercially valuable striped bass fishery, nearly forty years ago.

During the 1980s and 1990s a battle raged over the question: *Can the damage be repaired?* In 2002 EPA announced its final decision that dredging the toxic sediments from the river bottom is both feasible and prudent. (See *Sherkin Comment* # 28, 2001, for a previous article about that historic decision.)

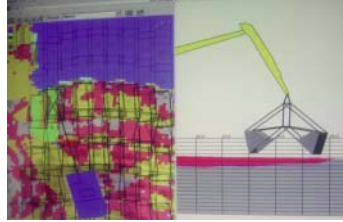
Strongly opposed to the project was GE, one of the worlds largest corporations. As the source of the pollutants, GE was legally responsible for the costs of cleanup. GE called EPA's dredging plan absurd and claimed it would be devastating to the river ecosystem. The company argued that PCBs are not nearly as dangerous as EPA (and most scientists) believe them to be. The company went on to assert that, in any case, natural processes were causing the older, contaminated sediments to be buried by cleaner sediments, eventually taking the PCBs out of circulation. And GE claimed that the dredging work itself would re-contaminate the river and disrupt shoreline communities for ten to twenty years, not the six years projected by EPA.

EPA, however, concluded that widespread, permanent burial of contaminated sediments was not happening; that PCBs are a dangerous toxin and probable human carcinogen; and that contrary to GE's arguments, the cure (dredging) was definitely *not* worse than the disease (contaminated fish).

Despite its long-standing opposition, GE ultimately entered into a series of legally binding agreements with EPA that obliged the company to implement the agency's decision under EPA's close oversight.

GE took tens of thousands of samples of river mud to determine exactly where and how deep to dredge. The company built a 110-acre, \$100 million processing facility at which the wet mud would be dried and prepared for rail transport to specially designed and permitted toxic waste disposal sites up to 2,500 miles away.

Actual dredging began in May, 2009 and continued through October of that year. No dredging took place during 2010, as all the parties and stakeholders conducted a year-long



Using GPS guided software, dredge operators are able to precisely remove only material targeted by EPA for dredging.



After an area has been dredged of contaminated sediment to the EPA's standards, clean backfill is transported on a barge by a tug boat. The backfill replaces dredged sediment and maintains the natural contours of the riverbed.



Granulated Activated Carbon is used to treat the water separated from the sediments at the processing facility. Following treatment, the water is discharged into the Champlain Canal.



The tugboat and barge must navigate through the lock system to get to the processing facility. The barges may make as many as 20 one-way trips to and from the processing facility during a 24-hour period.



Processed dredged material is stored at warehouses at the processing facility until it is ready to be loaded onto lined rail cars and transported to a disposal facility. Larger, coarse material is also stored on site and transported by rail to the approved disposal facilities.



As part of the clean up, the floodplains, low-lying shoreline areas, are also being evaluated for the presence of PCBs. More than 5,000 soil samples have been collected since 2002. These samples are analysed for PCB concentration.



Site Location Map – Hudson River PCBs Superfund Site, New York, USA.

fish they catch despite the warnings and restrictions that are in place.

Some environmental groups, and even some other government agencies, have recommended that still more dredging should take place. Indeed, it is possible that an agreement for more dredging by GE might be reached some day in the future. While EPA would certainly be supportive of any such agreement, the agency is satisfied that the goals for the project, which were set back in 2002, will be met in the years to come, and that the project has been an extraordinary success.

In any event, GE has more work to do. The next step is to investigate 80 miles of flood plains along both banks of the 40-mile project area. Flooding deposited PCBs onto some of these areas, and more cleanup is likely to be necessary during the next decade – this time on land, not in the water.

The Hudson cleanup will have implications far beyond the banks of this historic river. Sediments in other aquatic ecosystems throughout America, and indeed the world, are similarly contaminated some, like the Passaic River in New Jersey, with complex mixtures of pollutants including dioxin, organic chemicals and toxic heavy metals (see *Sherkin Comment*, Issue #58, 2014, at page 8). The Hudson River cleanup will point the way for decisions on many similar projects costing hundreds of millions even billions of dollars. And the fact that the work was carried out so competently and successfully will make it impossible for others to argue in the future that environmental dredging is simply too difficult or too risky.

For more information, visit EPA's Hudson River website at <http://www.epa.gov/hudson>

¹Walter Mugdan serves as Director of the Emergency & Remedial Response Division in Region 2 of the U.S. Environmental Protection Agency. Any opinions expressed in this article are his own, and do not necessarily reflect the views of the EPA.

assessment of the performance standards and operating protocols that governed this enormously complex project. Dredging resumed in 2011, and continued for close to six months each year thereafter.

Although GE fought EPA every step of the way before final government decisions were reached, once the company undertook the project it was carried out with great competence, skill, efficiency and professionalism.

And finally, on October 3, 2015, the last bucket of sediment came out of the river. Over the course of six dredging seasons (spanning seven calendar years) –

- a total of 2.75 million cubic yards of sediment were dredged – 100,000 more than EPA predicted in 2002;
- 310,000 pounds of PCBs were removed – twice as much as predicted;
- resuspension (PCBs that get back into the river as a result of the dredging itself) ran at about 1.5% – half as much as predicted by EPA, and less than a quarter of what GE predicted;
- the amount of PCBs in the water that left the 40-mile project area and entered the lower Hudson River was about half what EPA had predicted; and

- there were virtually no significant "quality of life" issues (noise, lights, odors), contrary to GE's predictions, which had stirred up intense fears among communities and residents living along the project area.

The costs of this work – the largest environmental dredging project in history – were large indeed. EPA estimates that the company spent \$2 billion or more; the company is not required to disclose its actual expenditures, and it has not done so. GE also spent over \$100 million dollars to stop PCBs still leaking from beneath its two former factory sites.

SO – was all this toil and expenditure worth it? Will the fish in the Hudson River be clean enough for people and animals to eat? EPA is confident that the answer is Yes.

It is important to note that, notwithstanding the huge amount of toxins removed from the river, a significant amount remains – enough PCBs so that some parts of the river will still be unsuitable for non-restricted human consumption of fish for years to come. But EPA predicts that all the fish will be much less contaminated, and therefore much safer, relatively soon after the end of dredging. This is particularly important, because it has been well documented that many anglers eat the



Kangaroo Island, south-west of Adelaide, is the third largest island in Australia.

By Anthony Toole

TEN minutes after leaving the ferry at Penneshaw, we drove off the road onto the rough track that led to our Island Beach chalet, and spotted our

first wallaby, nibbling the sparse grass at the trackside. The chalet itself stood on steel piles above a small, scrub-covered rise, so that from its balcony we could gaze past similar, broadly spread dwellings to the white

sands and intense green waters of Eastern Cove. This was to be our spacious and very comfortable base for the next three days.

Kangaroo Island, to the south-west of Adelaide, is Australia's third largest

island, after Tasmania and Melville Island. It is 150 kilometres long and varies in width from 55 to 90 kilometres. Its population stands at 4500, one-third of which resides in Kingscote, with the rest scattered thinly. Half the land is agricultural. The other half is uncleared wilderness, and half of that is divided among national parks, conservation parks and wildlife protection areas. Only 340 of the 1600 kilometres of roads on the island are surfaced.

The island was discovered and named by Captain Matthew Flinders, who mapped much of the northern coastline in 1802. Travelling east, he met a French ship captained by Nicolas Baudin, and

despite their countries being at war, they cordially exchanged maps and information. Baudin went on to map the whole of the island, with the result that the names of the bays, capes and headlands reflect both their English and French inspirations.

The slope behind our chalet was wild scrubland, and each evening, a small group of Tamar wallabies gathered there to dine on the vegetation. Elsewhere, we were frequently able to pause in our travels to observe representatives of the subspecies of western grey kangaroo from which the island derives its name.

There are no foxes or rabbits here, so the devastation caused by these non-native animals on the Australian mainland has been avoided, and the native species thrive. However, an unexpected problem has arisen because of the absence of major land predators. Koalas, that were extinct in South Australia, were introduced to Kangaroo Island in the 1920s. Their population has grown to the extent that they have destroyed large areas of the native vegetation that is their main food source.

We made our way west along the Hog Bay Road, pausing only to climb Prospect Hill, which Flinders had climbed with his botanist, Robert Brown, expecting to gauge the extent of the southern part of the island. Instead, he found himself on the neck of a narrow isthmus between what he named as Pennington Bay and Pelican Lagoon, the latter reflecting the abundance of the eponymous birds that are found everywhere here.

Kangaroo Island is an important conservation area, as it contains healthy populations of many birds that are in decline on the mainland.

Among the 250 recorded species are white-bellied sea eagles, wedge-tailed eagles, fairy terns, Pacific gulls, black-faced cormorants, western whip birds and pied oystercatchers.

The Australian pelicans are larger than their American counterparts, but they cannot dive, and are only able to feed on fish swimming near the surface. Beautiful blue fairy-wrens have little fear of humans and can be seen flitting around picnic sites. Endangered Cape Barren geese were introduced in the 1930s and are now thriving. There are also satisfying numbers of ground nesting birds, such as bush stone-curlews, that have benefited from the absence of predators. Numbers of elsewhere endangered species, such as glossy black cockatoos and hooded plovers are steady or even slowly increasing.

The same cannot be said for the little penguins, the smallest in the world. They can be seen near Penneshaw and Kingscote, returning to their burrows in the rocky coastline at dusk, after a day fishing at sea. They are in rapid decline as a result of predation by New Zealand fur seals.

We continued west along a road lined with mallee scrub, made up of eucalypt species on which several tree stems grow directly from the roots, to create a sanctuary for wildlife that, in most places, is virtually impenetrable to humans. The surfaced road took us south into the Flinders Chase National Park and on to Cape de Couedic, which is not quite the southernmost tip of the island. Here, we abandoned the car and followed a wooden boardwalk that descended gently across a limestone pavement, from the grikes of which grew colourful flowers,

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Tamar wallaby.



Western grey kangaroos.



Koala.

Images courtesy of Anthony Toole

red succulents and thick, woody shrubs. On one of the clints, a heath goanna soaked up the sun. Quite rare on the mainland, this is Kangaroo Island's largest land predator.

The limestone steepened into a cliff, which rested on a broad, sloping expanse of metamorphic slabs across which lay dozens of New Zealand fur seals, many of them suckling their pups. We zig-zagged down steps onto the bedrock, from which we could look through the spectacle of Admiral's Arch.

The rock along this stretch of cliff consisted of aeolianite, in which wind-blown sand had been hardened by calcium carbonate percolating through from the limestone above. Erosion by wind and sea had created this huge archway, from the roof of which hung irregular growths made up of calcified plant roots. The sloping bedrock, on which the seals congregated, dated from the Cambrian period, 500 million years ago.

A short distance from the car park stood the Cape de Couedic lighthouse. Built in 1907, following several ship-

wrecks, this was the third lighthouse on Kangaroo Island. Its situation was so isolated that the building materials were winched up a still visible channel in the cliff face using a device known as a 'flying fox' powered by two horses. Stores for the lighthouse continued to be winched here every three months until an overland track was constructed during the 1930s. The first truck did not arrive until ten years later.

We followed a cliff-top road eastward to the aptly named Remarkable Rocks, a jumble of crazily shaped boulders up

to five metres tall, that were clearly visible from the Cape. They appeared to balance precariously on top of an enormous granite dome. Also laid down volcanically during the Cambrian, they had been fractured and eroded into caves and tunnels by wind and rain over the last 200 million years. Over many of the boulders and the supporting dome were vivid crusts of orange lichens.

The following day, we took the southerly of the two surfaced roads, past Murray Lagoon, the largest lake on the island. Evidence has been found here of Aboriginal

occupation perhaps 2500 years ago, though by the time Europeans arrived, these people had either died out or moved back onto the mainland. A second road led off from this to the visitor centre at Seal Bay, where we joined a guided party down to the beach to observe a colony of Australian sea lions

Though these animals are about twice the size of the

New Zealand fur seals, their numbers are much lower. It is estimated that the number of fur seals on Kangaroo Island alone is double that of the world population of Australian sea lions.

This was the breeding sea-

son, and several large bulls guarded small groups of females that had recently given birth to pups. The females usually become fertile again for a period of 12–24 hours some 7–10 days after giving birth. Unlike the fur seals, these sea lions can use their flippers for walking and often migrate up to a kilometre inland to shelter from storms. There were many tracks through the dunes, and beside one of these lay the desiccated skeleton of a juvenile humpback whale that had washed ashore during a storm in 1984.

Before returning to our chalet for our last night, we ended our too brief exploration of Kangaroo Island with a visit to Vivonne Bay, a few kilometres to the west of Seal Bay. A strong, hot wind blew the sand about, so we sheltered among the dunes to enjoy a picnic. We then stepped back onto the beach, which curved in an unbroken line for ten kilometres. A small flock of terns rested near the water's edge, as did a couple of Pacific gulls. Apart from these, we had the entire beach to ourselves.

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The aptly named Remarkable Rocks on Kangaroo Island.



Remarkable Rocks' crazily shaped boulders are five metres tall. They were laid down volcanically during the Cambrian Period and have been fracturing and eroding ever since.

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An Bord Pleanála Annual Report 2014

By Dr. Mary Kelly

AN BORD PLEANÁLA is the national planning appeals body set up originally to determine both first and third party planning appeals against decisions of local planning authorities on planning applications. That role has expanded over the years and there are currently over 150 case types that can be dealt with by An Bord Pleanála. In terms of volume, planning appeals usually account for the vast bulk of annual intake (80% in 2014) (Figure 1).

Planning appeal cases range from relatively simple to very complex depending on the nature of the proposed development and / or the issues raised.

While small in number, Strategic Infrastructure Development cases are large in scale with applications made, in the first instance, directly to An Bord Pleanála. Applications typically relate to large scale energy, transport, environmental, health, electricity, gas, rail and road developments.

In line with conditions in the economy and impact on the property and construction sectors, An Bord Pleanála's caseload has fallen from a peak of 6,664 cases in 2007 to 1810 cases in 2014 (Figure 2), but there are signs of an increase in recent months. An Bord Pleanála's job is to ensure that development is sustainable from a social, environmental and economic point of view. Spatial planning – where we want to put things on this island – has a hugely important role and An Bord Pleanála continues to play its part in an independent, transparent and fair manner.

Planning Appeals

An Bord Pleanála received 1,456 normal planning appeals in 2014, an increase from 1,396 received in 2013. In 2014 more than half of all normal planning appeals related to residential development (Figure 3), the bulk of which are categorised as householder development and single houses. In 2015 we are beginning to see an increase in the number of multiple residential units before the Board.

Some planning appeals are treated as 'Priority Appeals'. These are in respect of developments which have a significant employment or economic potential, school buildings / educational facilities which are in line with Government policy in this area.

Strategic Infrastructure Development

Applications for Strategic Infrastructure Development come to An Bord Pleanála directly for decision

and are generally large and complex and can attract considerable public attention. Typically, these cases involve oral hearings and often involve requests for further information to clarify aspects of the proposed development. Environmental Impact Assessments are usually required and, frequently, an Appropriate Assessment must be undertaken by the Board for these cases.

The nature of these proposals necessitate detailed and robust examinations which can withstand potential judicial review, the only way of challenging these decisions. It is not surprising, therefore, that decisions on Strategic Infrastructure Development proposals can often run over timelines set for decision making. In 2014, 20 such applications were concluded, 16 from local authorities, including 7 road projects. Other cases included energy infrastructure projects and a development at Dublin Airport.

Wind Energy Developments

Wind energy developments currently represent a significant workload for An Bord Pleanála and are submitted as appeals of decisions of local authorities or as direct applications for Strategic Infrastructure Development.

30 wind farm cases were lodged during 2014. An Bord Pleanála disposed of 13 of these cases, in addition to a further 12 cases that had been lodged before 2014. Of the decisions, 17 were granted (including one strategic infrastructure development), seven were refused and one was withdrawn. The majority of these cases required Environmental Impact Assessment and/or Appropriate Assessment.

Regularisation of Quarries

In 2011, An Bord Pleanála was assigned a new task relating to the regularisation of quarry sites to achieve compliance with the Environmental Impact Assessment and Habitats Directives. This work is difficult, requiring retrospective assessments of environmental impacts but when completed in 2015, it will mean that the quarry sector will be substantially regularised from a planning perspective.

Performance

Provisions in the Planning, Building Control and Water Pollution Acts and Regulations made under these Acts, set down as an objective of An Bord Pleanála, a requirement to ensure that appeals and certain other matters are determined within specified periods of time.

Taking all case types dealt with by

An Bord Pleanála into account, including strategic infrastructure, over 75% of cases were disposed of within the relevant statutory objective periods in 2014 (62% in 2013).

For normal planning appeals, the bulk of casework, 83% were disposed within the statutory objective period of 18 weeks in 2014. The average time taken for determination of appeals fell to less than 16 weeks in 2014 compared to 19 weeks in 2013.

Where the statutory objective period has not been achieved, cases are generally larger, more complex and may be subject to oral hearings and/or require further information to be submitted with subsequent re-circulation of material for comment.

Planning / Environment Interface

The interface between legislation related to planning and environmental protection has become increasingly complex with European Union policy and legislation having a major influence in Ireland over the past few decades. A body of case law has begun to develop, at EU level from the European Courts of Justice and at national level from the superior courts, which is having a big influence on how planning cases are dealt with.

In earlier years, much of this case law concerned Environmental Impact Assessment while, more recently, Appropriate Assessment under the Habitats Directive has taken centre stage. An Bord Pleanála is committed to protecting the environment, habitats and biodiversity through rigorous Environmental Impact Assessments and Appropriate Assessments under the Habitats Directive. However, the legislation implementing the environmental directives is very complex and has entailed numerous amendments of both primary and secondary legislation to bring Irish legislation into line with EU Directives.

New Work

An Bord Pleanála was designated the Competent Authority for Projects of Common Interest for trans-European energy infrastructure projects in December 2013. The new permit granting process is likened to a one-stop shop with An Bord Pleanála in a co-ordinating role for the issuing of all the consents required from all relevant authorities and to monitor compliance with time limits. The first project (the North-South Electricity Interconnector) is currently going through the permit granting process.

A new Planning Service

An Bord Pleanála is currently in the process of a major upgrade of ICT systems which will transform our internal work processes and how we deliver services to customers. Behind the scenes, a new case management system will be built during 2015 along with a geographic information system. A new website is to be developed that provides a fully digital service enabling online submission of planning appeals, applications and other documents and other website services in an accessible and user-friendly manner. Rollout of these services will commence at the end of 2016.

Review of An Bord Pleanála

An Bord Pleanála is currently the subject of a review being carried out at the behest of the Minister for the Environment, Alan Kelly, TD, with a view to making recommendations to support An Bord Pleanála in its operations and to ensure that it is appropriately positioned and fit for purpose from an organisational perspective to meet its legislative mandate. A public consultation period ended on 18th November and a report is due to be delivered to the Minister early in 2016.

Dr. Mary Kelly,
Chairperson, An Bord Pleanála
www.pleanala.ie

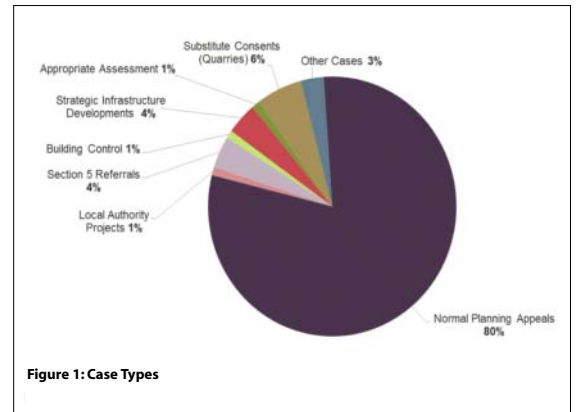


Figure 1: Case Types

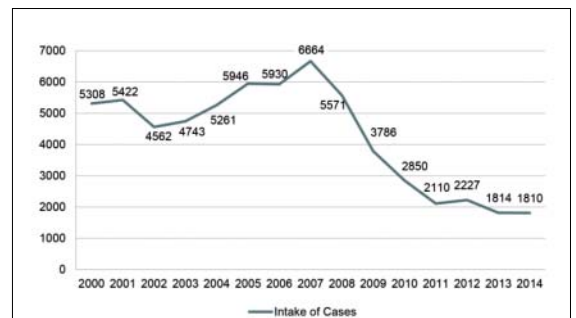


Figure 2: Intake of Cases 2000-2014

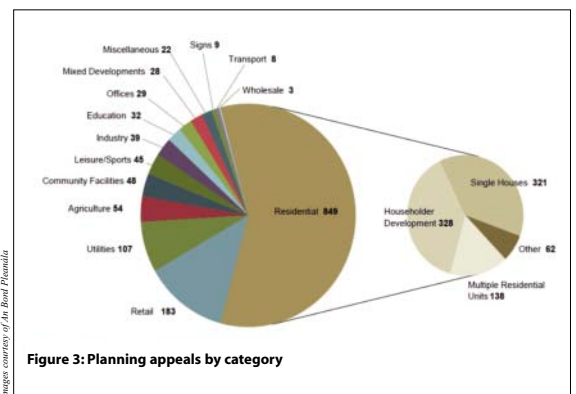


Figure 3: Planning appeals by category

Images courtesy of An Bord Pleanála

Why I became a marine biologist



Image courtesy of Chris Spurrier/Darrel Lonsman/epa

Four former volunteers (bods) from 1980 who attended the reunion in May 2015. The author is on the left.

By Chris Spurrier

DURING a long weekend surrounding Saturday 23 May this year I returned to Sherkin Island to join the celebrations that commemorated the 40th year of the Marine Station and the 80th birthday of its co-founder*. I am lucky to have spent three long summers there in 1980, 1981 and 1982 as one of nearly 600 'bods' (volunteer biologists) that contributed to the achievements of the station over the years. The reunion was an emotional roller-coaster of happy memories, renewed acquaintances of more than 30 years as well as new friendships and incredible hospitality, warmth and laughter. For those who were

fortunate enough to have been able to attend I am sure the occasion will not be forgotten and I would like to place on record my heartfelt thanks to Matt Murphy and his now extended family.

Over the years Matt has refined the art of requesting 'would-you-ever's' so did not miss the opportunity of asking me for an article for *Sherkin Comment* on why I became a marine biologist. [As I write this I note that the forthcoming issue of this publication will be No.60 which is in itself another noteworthy landmark]. My answer to 'why' is quite simple; it was the same inspiration as that mentioned by Pete Atkinson (a contemporary 'bod' from the early 1980s) in his tribute speech on 23 May – namely the television

programmes by Jacques Cousteau that brought the undersea world to the masses in the 70s. I was also fascinated by the series *Coral World*, presented by Roland von Hentig, but a little too young to have been drawn simply by the allure of Lotte (Hass) from a slightly earlier era.

Like Matt, Cousteau was always posing thought-provoking questions about the marine environment such as the one in the introduction to his book *Oasis in Space*, the first of the Ocean World series, published in 1973. Here he asks the rhetorical question about what would happen if the oceans should die. In the ensuing discussion of his own question he talks about the greenhouse effect, melting polar ice caps, a rise

in ocean levels, global drought and famine, bizarre storms and diseases, with families and society being totally disrupted. These topics all feature regularly on our television screens today mainly as a result of our over-exploitation of our planet's other resources so that the threat to the world's oceans has become a symptom, rather than the cause of these concerns. But he painted a bleak picture to draw attention to this potential plight and to raise awareness of the need to understand the functioning of the marine environment.

I was hooked, and I knew in my early teens that I wanted to be a marine biologist and would have loved to have met the iconic figure of his time. I learned years later that Cousteau's grand-daughter had stayed next door to me as a French exchange student with my neighbour's daughter. Apparently, she was a very good swimmer!

At secondary school I enjoyed biology and in my third year I came top of the class in the end of year exams. This is probably the only time I have excelled academically, but spurred on by this success biology was one of my A-level choices along with French (well you never know!) and Maths. My headmaster advised me against this combination, especially as I hadn't done chemistry at O-level, but I chose to ignore him. It turned out that he was probably correct as I struggled to gain a

place at university to study marine biology, especially as I failed Maths, but was eventually offered a place (which must have been through clearing) at Portsmouth Polytechnic to do a general biology degree. In my final year I was able to select Marine Biology as one of my two options so at last I was on my way.

By chance I sat next to Paul Blake in my first laboratory practical at college and was later to be the best man at his wedding. I mention him because it was through Paul that I came to Sherkin. He had responded to an advertisement in *New Scientist* for volunteers at the marine station and was working there on the now long-standing rocky shore monitoring and wrote to see if I was interested. Prior to that, the nearest I came to working as a marine biologist was when I turned up in person in response to another ad in the same journal for the post of Lundy Marine Warden. I came close to getting the job because of my initiative, but lack of experience had let me down. I was working as a milkman when I received Paul's letter so I jumped at the chance and after a brief telephone call to Matt, which I barely understood because of the unfamiliar accent, I found myself hitching to a remote corner of southwest Cork.

As I got closer to Baltimore, everyone I met on route seemed to have heard of Matt's undertaking so I began to look forward to my ven-

ture. When I eventually reached my destination the marine station was completely deserted and I wondered what I had come to. It later transpired that everyone had been out at the Fastnet lighthouse doing shore survey work on the rock itself and diving its surrounding waters. The divers were a visiting group from the British Museum (Natural History) as it was known then and it was through that brief encounter that my future career as a marine biologist was to take off.

But for the time being I had come to Sherkin to work on a zooplankton survey and this was the first opportunity I was given to gain some of the valuable experience that is a pre-requisite for any line of work. I will always be grateful for the faith Matt had in young people like myself and literally hundreds of others who passed through Sherkin Island Marine Station and for the help his family gave me in achieving my goal.

*See article in *Sherkin Comment*, Issue No. 59

Chris Spurrier is a free-lance marine biologist based in Kent, England. He has worked widely in the UK and Ireland on diving and intertidal environmental surveys. He is primarily a zoologist, interested in sponges, hydroids and bryozoans. In the next issue of Sherkin Comment Chris describes how his career evolved.

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On the Care of Our Common Home

By Alex Kirby

JUNE 2015 was significant for the world's Catholics, and more widely too. It was the month when Pope Francis published his encyclical, the highest form of teaching document a pope can publish, entitled *Laudato Si* [Be Praised], *On the Care of Our Common Home*. It urges everyone, not Catholics alone, to protect the Earth.

The 192-page letter lays much of the blame for global warming on human activities and human selfishness. It has attracted criticism for what it says about population, that perennial doctrinal dividing line between Catholics and almost everyone else.

The Pope is clear on the issue: "Instead of resolving the problems of the poor and thinking of how the world can be different," he writes, "some can only propose a reduction in the birth rate. While it is true that an unequal distribution of the population and of available resources creates obstacles to development and a sustainable use of the envi-

ronment. . . demographic growth is fully compatible with an integral and shared development."

He has also been attacked by climate deniers. Jeb Bush, Catholic son and brother of two former US presidents and himself a Republican presidential hopeful, said he did not get his economic policy from his bishops, cardinals or pope, so why should he get his environmental policy from them. Perhaps his economics would be better if they were Gospel-based.

Lord (Nigel) Lawson, once Margaret Thatcher's Chancellor of the Exchequer, is now a prominent British critic of the mainstream approach to climate change. He described the encyclical as "a thoroughly reactionary document. A mixture of junk science, junk economics and junk ethics, what Pope Francis advocates would prevent the world's poor from escaping from poverty . . ."

But probably more important in the long run than the headline-seekers' barbs are the reactions of those who have no axe to grind but are

genuinely keen to know what religion has to say about the physical world.

A recent Anglican church meeting in a small town in southern England suggested that before Francis Catholic leaders had made very little headway in helping people to understand even the basics of caring for the environment. One speaker was delighted that the encyclical had introduced the notion of stewardship, clearly a revelation to several of those present. But stewardship is not a new idea.

You may have reservations about stewardship. You may echo the dismissal of it by James Lovelock, originator of the Gaia Hypothesis: "Humans are as qualified to be stewards as goats are to be gardeners." But stewardship can at least be an entry point to understanding human interdependence with the environment. One reason the encyclical caused such a stir was the fact that it burst from a clear blue sky, ending the silence of generations on the subject (punctuated occasionally by Papal pronouncements).

What Pope Francis said –

and didn't say – is important. He has put down a marker, telling his church, and the rest of us, of his "conviction that everything in the world is connected". For a religion which has taught for so long that humans have been given dominion over the earth, that is a radical departure.

The fact that he has used an encyclical, which, as he noted, "is now added to the body of the Church's social teaching", means he has told Catholics that the environment is something they cannot ignore. It is, for them, something they must think about and work to protect, as he hopes it will be for everyone.

In a church as centrally organised as Catholicism, that counts for something. Anglican archbishops can instruct their faithful to believe, to care, to act about whatever they choose, but there is no way to ensure that anyone will take the slightest notice of the primates. The same goes for many other churches and religions.

But the Catholics are different. They now have to accept that the environment matters and they have something else to think about: they have, in secular terms, another box that must be ticked.

So far, so good. But – despite the popular miscon-



Saint Peter's Basilica, Vatican City.

ception – the Catholic church cannot control what goes on in the heads of its adherents. They will continue to think, and to act accordingly. And while the Jeb Bushes and Nigel Lawsons of this world continue to question scientific fact, and while fossil fuel conglomerates continue to pay others to spread doubt on their behalf, there will be those who mistrust what the climate scientists are reporting, claiming that their findings are "not proven". That's like saying the Law of Gravity is not proven, and those who doubt climate science should, logically, refuse to believe in gravity, whatever the consequences.

For another, linked reason the encyclical may struggle to change the minds of its readers any time soon. It has certainly given them some-

thing else to think about, apart from the daily round of paying for a new church roof, supporting the ecclesiastical bureaucracy and all the other preoccupations of a congregation. But it may take a long time before it manages to do what Francis clearly wants, which is to introduce them to a new way of thinking.

When climate change becomes the prism through which you see the world, you do think differently. You wonder what sort of world you will bring your children into, or whether you should bring them into it at all. Francis has started something. It's fortunate he is a patient man.

Alex Kirby is a founder editor of the Climate News Network (www.climatekeyword.net).

National Strategy for Angling Development

Inland Fisheries Ireland (IFI) has consulted previously on the preparation of a National Angling Development Plan. Following this consultation and research undertaken by IFI, IFI has prepared the National Strategy for Angling Development (NSAD). The NSAD is the first comprehensive national framework for the development of our angling resource.

All the relevant documents pertaining to the National Strategy for Angling Development may be viewed or downloaded from www.fisheriesireland.ie/NSAD

There will now be a further round of public consultation commencing on November 30th. Written submissions or observations should be sent to: NSAD.consultation@fisheriesireland.ie or NSAD Consultation, 3044 Lake Drive, Citywest Business Campus, D24 Y265.

All submissions must be received no later than January 4th, 2016.

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Met Éireann's Voluntary Observers



Brother James O'Hare taking readings at the Warrenstown Climatological Station, Co. Meath.



Stephen Henry McGarry circa 1941.



By Joe Lyons

SINCE the early 19th century hundreds of voluntary observers have been measuring temperatures, rainfall and other meteorological variables on a daily basis in Ireland. This data has been analysed by the relevant authorities to produce descriptions of the various aspects of Irish climate, for use by a wide variety of people and organisations, to contribute to improvements in the economy and to the safety of the Irish people. In more recent times, the importance of good climatological records has increased with the concerns regarding global climate change introduced by man himself. With the establishment of the Irish Meteorological Service in 1936 a new era of hourly observations began. However, the daily readings from the much more dense observational network of voluntary observers has continued to be the backbone of climatological work within Met Éireann.

For weather records to be of full value they must have been maintained over a very considerable period. When, for instance, reference is made to mean values of meteorological elements for a particular area the mean is an average calculated over a period of thirty years, and for the study of climatic change successive means for successive thirty year periods are required.

The Ordnance Survey Office at Phoenix Park in Dublin had already been keeping weather records for 100 years before the Irish Meteorological Service was established in 1936. Markree Castle in Co. Sligo is another notable weather station. In the 1830s the Cooper family had established at Markree one of the best equipped astronomical observatories in Europe and with it, a weather station.

A great debt is owed to the many families who have contributed to the vast historical archive of data held by Met Éireann through their participation in the Voluntary Observer Network.

Joseph and Julia Deane started taking rainfall readings in Longraigue, Foulkesmills, Co. Wexford in 1873. At some stage before 1937 they passed the task on to their daughter Julia. Following her death in 1958 the mantle was taken up by her cousin Maurice Gibbon who had acquired the property. It is his son John and his wife Caroline who now continue the tradition of rainfall observer to this day.

In 1897 in Mount Callan, Inagh, Co. Clare Frederick St Leger Tottenham started another labour of love with observing the weather

which continued to the 1930's. His son Robert Garnier Tottenham then took over until 1951 when he passed the task to his son Robert Edward Tottenham. Robert continued to take readings up until his death in 2007 and since then Robert's wife Jane has taken on the responsibility of ensuring that rainfall readings continue at Mount Callan.

In the latter part of the 19th century the Office of Public Works initiated a program of monitoring rainfall along the Shannon and particularly at the locks. In 1907 the lockkeeper at Victoria Lock, Meelick near Banagher, Co. Offaly began taking rainfall readings. His name was Bernard McGarry. The McGarry family still take rainfall readings at the lock having passed the task on through four generations, father to son, from Bernard to Stephen Henry to another Bernard and lastly to the present Stephen.

But even these pale into insignificance compared to the outstanding contribution of Brother James O'Hare of the Salesian Order and former principal of Warrenstown Horticultural College.

The Climatological Station at Warrenstown, Co. Meath has been in operation since July 1951 and Brother O'Hare, now 86, has been taking measurements almost continuously since then. His interest in weather reporting came from its importance for gardeners and farmers whom he taught for more than 50 years in the college. The photograph of Bro James taking his morning temperature readings in the snow, demonstrate the level of dedication and commitment that he has to his observational routine.

The Horticultural College closed in 2009 and sadly this year will bring an end to the Salesian Order's long association with Warrenstown. Sadly for Met Éireann this will also signal the final readings from Brother James O'Hare at Warrenstown.

Met Éireann maintains a network of synoptic weather stations throughout the country which operate 24 hours a day, and which record hourly values of pressure, wind, temperature etc. These are sufficient for normal weather forecasting purposes. But a much higher density of observations is needed to define the long term climatology of the country – the detailed, localized variation of parameters such as temperature and rainfall over periods of many years.

This need is met by the climatological network. The stations in the climatological network are divided into two categories;

- Rainfall Stations, about 450 at which daily

Images courtesy of Met Éireann



Stephen Henry McGarry circa 1941.

- falls of precipitation are measured, and
- Climatological Stations about 60, which in addition to daily precipitation also record maximum and minimum temperatures, sunshine duration, and various other parameters.

The weather station established at Sherkin Island in July 1972 falls into the latter category. Sherkin Island entered a new era in 2004 when the station was further enhanced with the installation of a Met Éireann AWS (automatic weather station) called TUCSON (The Unified Climatological & Synoptic Observing Network).

Despite technological advances, the voluntary observers will still remain an indispensable element in monitoring Ireland's weather and climate especially rainfall. Only through their efforts can Met Éireann continue to obtain the localized weather information.

Met Éireann are always looking for new locations and dedicated observers to measure rainfall. The actual task requires a certain commitment although it is neither time consuming nor difficult. Ideally, we would prefer if a climatological station could provide long term records for a particular area. The four most important requirements, which must be met, are set out below:

- Observations must be made each day at 0900 Greenwich Mean Time (9a.m. in Winter and 10a.m. during Summer);
- The instruments in use must be of a standard design and where applicable, must be certified by the appropriate body (instruments will normally be supplied by Met Éireann);
- The instruments must be correctly set up on

a grass plot which is on generally level ground away from the immediate influence of obstructions such as fences, plants, trees or buildings;

- All data recorded should be returned to Met Éireann on the appropriate forms following the end of each month.

The table below highlights just 10 of the areas from where Met Éireann would like to have more rainfall data. However, Met Éireann would consider any part of the country if we feel that records from that area may be of benefit to the archive.

COUNTY AREA of INTEREST	
Cork	Beara/Sheep's Head Peninsulas
Cork	Tareilton
Donegal	Glencolumbkille
Galway	MountBellew
Galway	Woodford
Laois	Portarlington
Limerick	North of Bruff/Hospital
Longford	Ballymahon
Offaly	Kilcormac
Roscommon	Castlerea

*If you know anybody who may be interested in becoming a weather observer contact:
 Joe Lyons: 01-8064279 087-6736232
 joe.lyons@met.ie or Gerard Griffith: 01-8064256
 087-2351503 gerard.griffith@met.ie*

Catchment Management and Water Framework Directive Implementation

By Donal Daly & Paddy Morris

Catchment Science & Management Unit, EPA

Under the Water Framework Directive (WFD), Ireland is obliged to complete River Basin Management Plans (RBMPs) every six years. Unfortunately, implementation of the original RBMPs, published in 2009, and development of the 2nd cycle of plans was significantly impacted by the recession. While the 2nd cycle of plans was originally due to be completed in 2015, this has now been delayed until 2017.

In addition to the change in *when* the plans will be delivered, Ireland is also changing *how* they will be prepared and implemented – with a new 3-tier governance structure being put in place by the Department of Environment, Community, and Local Government, who will lead the top tier of WFD governance, and is responsible for policy, regulations, resourcing, and sign off of RBMPs.

At the 2nd tier, the EPA's new Catchment Science and Management Unit has been assigned the role of coordinating the technical implementation and reporting for the 2nd Cycle, including facilitation of the following: i) characterising our catchments; ii) reviewing the impact of human activities; iii) preparing template River Basin Management Plans; iv) drafting environmental objectives and v) compiling common programmes of measures for further development and input by local authorities before finalisation and approval by the Minister.

At the third tier, a new local authority Water Framework Directive office has been set up, led by the Kilkenny and Tipperary local authorities. This office will be staffed by three regional coordinators, three support officers and 12 community water officers, who will co-ordinate the local catchment management and public participation elements of water management.

We have thought about our vision for the EPA Catchments Unit, and it is "Working together to achieve

healthy, resilient, productive and valued water resources that support vibrant communities"; this message is captured in our logo (see below). We also want to see local catchment communities developing their own vision, perhaps along the lines of: "A river for people: healthy, accessible and contributing to community well-being"; but clearly this is for communities themselves to decide on.

So, what have we been doing? We have:

- Put 'catchments' at the heart of water management, with our motto being "Catchments: connecting land, people and water from the mountains to the sea" (see catchment image).
- Divided the country up into 46 catchments and 582 subcatchments in consultation with local authorities; these subcatchments have been chosen as a practical scale for analysing water quality issues and the measures needed to protect water, as well as being appropriate for local community engagement – everyone knows everyone at this scale.
- Promoted the integrated catchment management (ICM) approach to water management; ICM is an approach that requires that all water types (groundwater, rivers, lakes, estuarine and coastal) and associated ecosystems are considered holistically, that relevant disciplines and organisations work together, and that local communities have an important role.
- Developed a three-tier risk characterisation approach, ensuring that the assessment effort is commensurate with the level of risk, thereby enabling a targeting of EPA, local authority and other public body resources.
- Have helped develop, with colleagues in the Informatics Section of the EPA, an automated system, called the WFD Application, for accessing ecological and hydrochemical data, status and risk results, and trends. Local authorities and other public bodies can access this information through EDEN Ireland.
- Facilitated the setting up of the Catchment Management

Network, consisting of a national implementation group and working groups as a means of facilitating engagement with local authorities and other public bodies.

- Commenced characterisation of the 582 subcatchments (ranging in size from 100–200 km²) and 46 catchments (e.g., Brosna catchment), with assistance from our ecological, groundwater and enforcement colleagues in the EPA, and RPS consultants. To-date, we are using the Suir catchment as a pilot and work on this catchment is nearing completion.
- Contributed to the DECLG Strategic Water Management Issues (SWMI) Report. The full text of the document is available on the Department's website www.bit.ly/IRLSWMI and views can be submitted to the Department until 18th December 2015.

The first Catchment Newsletter has been published; this can be accessed at: http://epa.newsweaver.co.uk/icfiles/1/34894/164230/5382523/9400f958d15997d53528548a/catchments%20newsletter_%20issue%201%20October%202015_2.pdf

What are our future plans?

A draft River Basin Management Plan (RBMP) must be completed by end December 2016, with the final plan completed by December 2017. The role of the EPA is to produce a template RBMP for completion with the input of local authorities, other public bodies and the DECLG. Therefore, by July 2016, the subcatchment characterisation process will need to be completed and soon afterwards the



A catchment area – from source to sea.

catchment reports. As the Unit completes initial characterisation of subcatchments in each catchment, the local authorities will input to the process. Assessment of potential management strategies and mitigation measures to deal with the sources of pollution, such as wastewater treatment plants, agriculture and forestry has commenced. We have a window of opportunity in Ireland to 'make a difference' in managing our water resources – high quality information, new structures and resources, and a willingness and momentum. *Carpe Diem* – let us seize the day.

Donal Daly & Paddy Morris,
Catchment Science & Management Unit, Environmental Protection Agency, Richview, Clonskeagh, Dublin 14. www.epa.ie

CATCHMENT NEWSLETTER

The very first edition of the Catchments Newsletter has recently been published. While the EPA has taken the lead in coordinating this newsletter, they are relying on your continued contributions to make this a success. They welcome any comments, suggestions or articles that you would like included in future.

In future issues they would like to include case studies and examples of best practice from around the country and beyond on topics related to catchment science and management, so if you have any examples in your area please share them with them. Also they're very interested in your continued feedback so please let them know if there are any improvements that can be made for future issues. They hope to issue the Newsletter quarterly in 2016 so there will be plenty of opportunities for the Newsletter to evolve and become a valued resource for all involved in catchment management.

Email: catchments@epa.ie

http://epa.newsweaver.co.uk/icfiles/1/34894/164230/5382523/9400f958d15997d53528548a/catchments%20newsletter_%20iss ue%201%20October%202015_2.pdf


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GILTHEAD SEA-BREAM (*Sparus aurata* L.) in Irish Waters

By Declan T.G. Quigley

GILTHEAD SEA-BREAM (GHSB) have been recorded in the Eastern Atlantic from southern Scandinavia (62° N) southwards to the Cape Verde Islands (15° S), including the Mediterranean and Black Sea. Prior to the early 1970s, the species was considered as a rare vagrant in Irish, UK and other NW European waters. However, over the last two decades, the species has been recorded with increasing frequency along the south coast of Ireland, in the English Channel, southern Wales, and in other NW European waters, including the North Sea, Scotland, Belgium, Denmark, and Sweden.

Many historical references to the occurrence of GHSB in Irish waters dating from the late 18th century are unreliable due to general taxonomic confusion. The earliest known authenticated specimens of GHSB recorded from Irish waters were taken during the late 19th century. The first specimen was found dead in a tidal pond in Bantry Bay, Co Cork around 1866, and another specimen, was taken by the Royal Dublin Society research vessel 'Fingal' while beam trawling in deep water off Achill Head, Co Mayo during July 1890. It was 52 years later before the next specimen was recorded during June 1941 off Cork, and over 32 years later, before the first specimen was captured on rod & line during April 1972 at Ardmore, Co Waterford.

GHSB first began to appear in Irish waters with increasing regularity from about 2001 onwards when a small specimen was captured on rod & line at Aghada Power Station in Cork Harbour. Over the next few years several more rod-caught specimens were reported from a wide range of coastal locations along the south coast, including Kilmore Quay, Cunnigar, Cork Harbour, Courtmacsherry, Ring, Rosscarbery, Union Hall, and Valentia. During the same period, a number of specimens were also recorded by inshore commercial vessels. For example, during March 2004, a mussel dredger captured a small specimen in Wexford Harbour. During September 2004, c40-45 specimens were captured in a gill-net near Mizen Head, Co Cork. During January 2005, a

small specimen was captured in a *Nephrops* trawl off St John's Point, Co Donegal, and during September 2009, a specimen weighing 1.7kg was captured in a net off Crosshaven, Co Cork.

Although no eggs, larvae or post-larvae have been found in Irish waters to date, over the last decade, juveniles measuring 0.2-12.0cm, have been recorded from several inshore sites along the W, SW, S, SE and E coasts, so it is possible that the species may sometimes spawn successfully either in or close to Irish waters, particularly during exceptionally warm years. The GHSB is a coastal euryhaline species, usually found in sea-grass beds, sandy bottoms and surf zones, commonly down to depths of 30m. However, adults can occur at depths down to 150m, living either solitary or in small schools. In the early spring they undertake a trophic migration towards estuaries and coastal brackish water lagoons, where food is more abundant and temperatures are higher. In autumn they return to deeper water to either breed as adults or to avoid decreasing temperatures in inshore waters. GHSB are very sensitive to low water temperatures, with a critical lower lethal limit of 2°C.

The GHSB is a *protandric hermaphrodite*; i.e. most individuals initially develop as functional males (at 20-30cm TL; 1-2 years of age) prior to becoming functional females (at 33-40cm TL; 2-3 years of age). During the breeding season, which extends from October to January in the western Mediterranean, and from April to May in Biscay, females batch spawn 20-80,000 eggs per day. The species spawns pelagically, most probably in group-aggregations in mid-water. The relatively long planktonic larval stage, which lasts around 50 days at 17-18°C, facilitates widespread dispersal. Indeed, it is possible that the GHSB (both juveniles and adults) found in Irish waters may be derived from planktonic larvae carried into Irish waters from spawning sites in Biscay. Although Irish GHSB appear to be genetically distinct from wild French populations in central Biscay, it is possible that some of the Irish specimens might have been derived

from escapees from French or even Portuguese hatcheries. However, it is important to note that the species occurred in Irish and other NW European waters long before the development of the current aquaculture production units.

Adult GHSB are mainly carnivorous, feeding on a wide range of zoobenthos, particularly molluscs, decapod crustaceans, and annelid worms, which they can easily crush with their well-adapted molar dentition. Indeed, in some areas of the Mediterranean, the species is regarded as a pest causing significant economic damage to coastal shellfish farms. Although data is lacking from Irish waters, in Biscay, wild GHSB grow rapidly over the first few years, reaching a specimen weight of 1.4kg and length of 45cm at 5 years of age. Under optimum conditions, the species is known to reach a maximum length, weight and age of 70cm, 17.2kg and 11 years respectively.

Wild GHSB have been commercially exploited by inshore artisanal fisheries throughout its natural range for millennia, particularly in the Mediterranean, where the species has long been regarded as a highly prized food fish. However, wild fisheries production, which increased from 200 tonnes in 1951 to a peak of 9,654 tonnes in 2001, became increasingly unsustainable and has now been largely replaced by aquaculture production which increased exponentially from 10 tonnes in 1970 to 173,062 tonnes in 2013 (Figure 1). Indeed, during 2013, aquaculture accounted for 96% of total global production. The main GHSB aquaculture producing countries during 2013 were Greece (42%), Turkey (21%), Spain (11%), Egypt (8%) and Tunisia (5%).

GHSB were first included by the *Irish Specimen Fish Committee* (ISFC) in its list of eligible rod-caught species in 2006 at a minimum qualifying weight of 1.4kg. Since then, a total of 124 specimens have been ratified (Figure 2), including the current Irish Record, weighing 3.505kg, captured in Dingle Harbour on 17.08.2013. The current UK Rod-Caught Record, weighing 4.692kg, was captured during 1995 in Salcombe Estuary, Devon. The current IGFA World Record, weighing 7.36kg, was captured in the

Florn Estuary, Brest, north-west France during October 2000. Although there was a significant upward trend in the annual number of ISFC specimens recorded between 2011 and 2013, there was a sharp decline during 2014. The reason for the latter decline is unclear. It may simply reflect a decrease in angling effort, lower sea water temperatures, and/or the demise of previously strong year classes spawned during the early 2000s, or indeed, a combination of these and other unknown factors. It is interesting to note that the 2003 year class of juveniles found at Ballymacoda, Co Cork would have reached their potential maximum life span (11 years) during 2014. Wide fluctuations in stock levels have previously been noted in the English Channel, Biscay, and Galicia (NW Spain).

All of the ISFC rod-caught specimens were captured between April and November, the vast majority (93%) between May and September. Although the latter period probably coincides with the period of maximum angling effort, it may also coincide with a post-spawning inshore feeding migration of adult fish, thus providing anglers with a greater opportunity to target the species than at other times of the year. It is interesting to note that the condition factor of the specimens gradually decreased between May and July before increasing again during late autumn (August to October). The latter cycle may indicate a summer time spawning period followed by a post-spawning recovery period during the autumn.

Apart from one isolated specimen captured at Portstewart, Co Antrim, all of the ISFC specimens were recorded from the south coast, particularly from Co Cork (80%), and notably from Rosscarbery (26%), Cork Harbour (24%) and Clonakilty (24%). The vast majority of specimens were captured on crab (54%) and lugworm (34%) baits. Only 8% of the specimens weighed >2.2kg and all of the specimens weighing ≥1.4kg exceeded 40cm in total length.

Declan T.G. Quigley, Dingle Oceanworld (Mara Beo Teo), The Wood, Dingle, Co Kerry. Mobile: 087-6458485 Email: declanquigley@eircom.net



Gilthead Sea-Bream 3.24kg, Cork Harbour (2007) – Robert McClean.



Juvenile Gilthead Sea-Bream 5.9g, 8.7cm, Ballymacoda, Co Cork (2003).

Table 1. Specimen Gilthead Sea Bream Capture Locations

County	Location	Number	%
Co Cork	Rosscarbery	32	25.8
Co Cork	Cork Harbour	30	24.2
Co Cork	Clonakilty	30	24.2
Co Cork	Courtmacsherry	8	6.5
Co Wexford	Bannow Bay	8	6.5
Co Waterford	Ring	4	3.2
Co Wexford	Ballyteigue Bay	3	2.4
Co Wexford	Kilmore Quay	3	2.4
Co Waterford	Dunganvan/Cunningar	2	1.6
Co Waterford	Cullenstown Strand	1	0.8
Co Kerry	Ventry	1	0.8
Co Antrim	Causeway Coast/Portstewart	1	0.8
Co Kerry	Dingle	1	0.8
Totals		124	100.0

Figure 1. Global Production of Gilthead Sea-Bream Capture Fishes & Aquaculture (FAO 1950-2013)

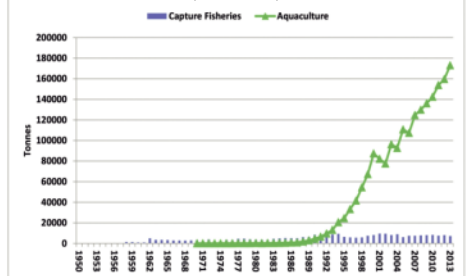
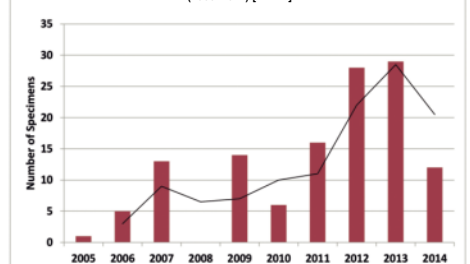


Figure 2. Annual Number of Specimen Gilthead Sea-Bream (2005-2014) [N=124]





An example of a Neolithic or New Stone Age home from around 6500BC, at the Irish National Heritage Park, Ferrycarrig, Co. Wexford. These buildings were quite tall and some archaeologists believe that they were feasting houses rather than homes.



Roped rye-straw thatch weathers to a wonderful silver colour, so that even in decay the thatch has visual appeal.



Clay on the ridge of the house, near Salterstown, County Louth.



County Kerry has few surviving old thatched cottages. However, a beautiful example of thatch is to be found at the popular tourist destination of Deenagh Lodge at the entrance to Killarney National Park.



The collection of houses, or clachan, at the folk park, Glencolmille, Co. Donegal, on a cold winter's day.

A Celebration of Irish Thatch

EMMA BRYNE was house-hunting in County Wexford when she came across a beautiful thatched cottage on the edge of a small village and knew it was the place for her. Her new home led to a fascination with thatch cottages, one of the most iconic images of Ireland. She set out to capture the variety and beauty of the many examples of this still-living craft to be found all over the island of Ireland and has presented them in *Irish Thatch*, a delightful book filled from cover to cover with over 350 beautiful photographs. Here is just a small selection.



Thatched roofs were mostly used on what is known as 'vernacular' buildings, where ordinary people build their own houses, barns and stables from local resources, independent of trained architects, formal styles and fashionable trends. The book, which is not intended to be a definitive or complete guide to thatching, is a celebration of a form of building that has survived from ancient times to the present day – a part of our shared history and part of our future.

In *Irish Thatch*, Emma briefly explores the history of thatch in Ireland, examining the raw materials involved – contemporary thatching materials include wheat, oats, barley, rye and water reed – and explains how a skilled thatcher carries out his work.

The main section of the book is a tour of thatched buildings throughout the country, from bustling city streets to remote boroecns with grass growing in the middle. Emma has endeavoured to include a cross-section of different thatching styles, from ancient to modern, as well as the quirky and charming that caught her eye. Though she could not fit all the thatch of the island into the book and the culling process was a difficult one for her, there are plenty of examples to give a sense of the history and styles of thatch throughout Ireland. The book leaves you with a sense of wonder in the craft and the commitment of owners to preserve and maintain these fascinating dwellings.

The book is published by O'Brien Press (www.obrien.ie) and costs €24.99. Hardback: 192 pages. Size: 250 x 216 mm. ISBN: 9781847176929.



The thatcher working on the gable of Old Mill Cottage.



The straw goes on in layers and is held in place with twisted hazel stays or scollops. Once the front and back are completed, the thatcher's start on the sides, building up the straw as per the front.



Old Mill Cottage, home to the author and her husband Jonathan.



Thoor Ballylee castle, near Gort, south County Galway, is a sixteenth-century tower-house built by the de Burgos. It is known as Yeats' Tower as it was home to the poet William Butler Yeats from 1921 to 1929. In the early 1900s the castle was part of the nearby Coole Estate, home of Lady Augusta Gregory, Yeats's lifelong friend. Coole House hosted many Irish Literary Revival gatherings. The tower is now in the hands of the state and the adjoining thatched cottage is a Yeats museum.



Open to the public, Hezlett House, Castlerock, County Derry, is one of the oldest thatched houses in Northern Ireland and is a built around a cruck-truss frame. Originally a rectory, its pretty features include the fanlights above the doors and the flax-thatched folly in the garden. The house is located on the edge of the spectacular Downhill Demense with nearby incredible views of Mussenden Temple, Downhill Strand and the Donegal coastline.



A thatching in progress. You can see the uncut reeds on the ridge and the difference in colour between the old and new straw.



A new housing estate in Kilmore Quay, County Wexford, is very much in keeping with the thatched aesthetic of the village. Most of the surviving Irish thatched properties date from the seventeenth to the nineteenth centuries. However, there are also new builds, such as this housing estate, and holiday homes. Thatch is less demanding on the land as the raw materials do not require quarrying or mining. The materials are sustainable and biodegradable.



Skerries has two restored mills, and this one, dating from around 1525, is still thatched. Flour has been milled here from the twelfth century up until the early twentieth century. It is thought that windmills came to Ireland with the returning Crusaders. The Skerries Mills are both 'tower mills', where the cap alone turns to face the wind. The thatched wooden cap is turned to the wind from inside the mill by hand-winch. When the wind blows and the sails turn, power is transmitted downwards via the central shaft to a single pair of grinding stones. Grain is carried manually to the top of the mill. There is a thatched windmill at Tacumshane, County Wexford, and Elphin Windmill, County Roscommon, is also of thatch.

Wildflowers of the North Cork Limestone River-Valleys



Image courtesy of Tony O'Mahony

Ivy Broomrape (*Orobanche hederaceae*)

By Tony O'Mahony

CORK is the largest county in Ireland, but its geological bedrock predominantly supports acidic soils that bear a flora adapted to these essentially lime-free habitats. Consequently, the botanist seeking out plant species that favour lime-rich soils, has no recourse but to visit the two

main regions of the county where calcareous soils predominate: (1) Cork City and Cork Harbour; and (2) the linear, Carboniferous Limestone valleys of the River Blackwater and its tributaries, the rivers North Bride, Awbeg and Funshion. This latter, aesthetically beautiful region of north Cork is home to many calcicole (i.e. lime-loving) plant species that are rare or of very localised occurrence in Co. Cork. My



Image courtesy of Sherkin Island Marine Station

The River Blackwater, Co. Cork.



Image courtesy of Tony O'Mahony

Toothwort (*Lathraea squamaria*)

own pioneer botanical surveys of this cave-riddled region began in 1970, and proved fascinating, educative, and occasionally ecstatically exhilarating. Some of my finds in two of these river systems are listed below, but readers' seeking a detailed account of the flora of this delightful region of Co. Cork, will find it in my book, *Wildflowers of Cork City and County* (The Collins Press, 2009).

The River Blackwater

The River Blackwater is approximately 140 km in length, of which some 97 km of its west-east course lies within Co. Cork. In the vicinity of Roskeen Bridge (roughly 16 km west of Mallow town) the River Blackwater flows over limestone bedrock for the first time, on its journey to the sea, its wooded banks here supporting localised populations of the calcicoles, Goldilocks Butter-

cup (*Ranunculus auricomus*) and Pendulous Sedge (*Carex pendula*). In the vicinity of Mallow these species are augmented with populations of Early Wood-violet (*Viola reichenbachiana*), Garlic Mustard (*Alliaria petiolata*), the majestic spires of Early-purple Orchid (*Orchis mascula*), swards of white-flowered, coumarin-scented Woodruff (*Galium odoratum*) and (in March-April) colonies of Toothwort (*Lathraea squamaria*) – a succulent-textured, pink or ghost-white plant that is parasitic on the roots of shrub species, such as Hazel (*Corylus avellana*). Another parasitic plant of locally frequent occurrence is the distinctive Ivy Broomrape (*Orobanche hederaceae*) which, as its name implies, has Ivy (*Hedera helix*) as a host species. The gregarious Ramsons or Broad-leaved Garlic (*Allium ursinum*) is locally dominant in damp sections of the woodland floor, where its umbels of star-like, delicately-scented white flowers, frequently cohabit with equally dense swards of the potentially-perfumed, bluish-violet blooms of our native Bluebell (*Hyacinthoides non-scripta*). Throughout the limestone stretch of the R. Blackwater valley, the fern species, Southern Polypody (*Polypodium cambricum*) forms decorative, luxuriant colonies on the boles and branches of trees. The shrub, Spindle (*Euonymus europaeus*) is another decorative component of the flora, displaying verdigris-green, often four-angled shoots, in addition to pink, three-sided fruit capsules that split open to reveal vibrantly orange-coloured (poisonous) seeds. The limestone outcrops of 'Lovers Leap', downriver of Mallow Bridge, support a suite of long-naturalised semi-woody species that bear evergreen leaves, namely: Rose-of-Sharon (*Hypericum calycinum*) displaying large, beautiful, yellow flowers; the exotic-looking Spurge-laurel (*Daphne laureola*) bearing rather inconspicuous, tubular, green flowers in February, and the equally early-flowering attractive shrub, Laurustinus (*Viburnum tinus*).

Downriver of Mallow, occur the main colonies of Sweet Violet (*Viola odorata*) and Sand Leek (*Allium scorodoprasum*) in this river-valley. While the native status of Sweet Violet anywhere in Ireland is suspect, it looks deceptively 'at home' in these woodlands, as does Sand Leek, which latter was first recorded from the R. Blackwater by H.C. Hart in 1885. (Note: Sand Leek is certainly of naturalised status elsewhere in Ireland.) However, the most

spectacular plant rarity on the River Blackwater is the woodland plant, Starved Wood-sedge (*Carex depauperata*), found here by the author in June 1973, in what is still its only known site in Ireland. This sedge bears the largest fruits of any European sedge species, and is of local/rare occurrence throughout its European range. It is a critically endangered species in Britain and Ireland, where it is legally protected. It may well be the rarest plant species in the Irish Flora, given that no more than twenty clumps of Starved Wood-sedge have ever been recorded on any visit to its River Blackwater habitat.

The River Awbeg

The 42 km course of the River Awbeg flows through Limestone terrain, and it discharges into the River Blackwater at Bridgetown Friary, downriver of Castletownroche village. At Annagh Bridge, near Churchtown, deep ditches of a former fen habitat (drained in the 1950s) still support a calcicole paludal flora, including such Co. Cork rarities as: Flowering-rush (*Butomus umbellatus*), with its distinctive umbels of ice-pink flowers; Fine-leaved Water-dropwort (*Oenanthe aquatic*), Lesser Water-parsnip (*Berula erecta*) and a trio of sedge species: Greater Pond-sedge (*Carex riparia*), Lesser Pond-sedge (*Carex acutiformis*) and the beautiful Cyperus Sedge (*Carex pseudocyperus*). Close to Buttevant village, a limestone outcrop supports a tiny population of the shrub, Dogwood (*Cornus sanguinea*), a species of extremely local occurrence in Ireland, and here in its only likely native Co. Cork site. It is accompanied by other calcicoles, such as Calamint (*Clinopodium ascendens*), Rough Hawkbit (*Leontodon hispidus*) and Crested Hairgrass (*Koeleria cristata*), this distinctive grass species of very rare occurrence inland in Co. Cork. On the stretch of the river between the villages of Doneraile and Castletownroche, the beautiful water-meadows support populations of such Cork plant rarities as the stately Water Dock (*Rumex hydrolapathum*) and Wood Club-rush (*Scirpus sylvaticus*), this latter species of extremely local occurrence in southern Ireland. The exotic-looking American Skunk-cabbage (*Lysichiton americanus*) has been established in water-meadows at Castletownroche since at least the 1960s.

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GSI

Nature in Irish Stamps

By Barney Whelan

STAMPS are something we sometimes take for granted – effectively a receipt for a service purchased, they also indicate to the service provider that it is fine to proceed with delivery. However, these small items which include text, images, image combination, format, colour etc can be quite complex both as a result of their scale and their function as a bearer of messages.

Stamp design requires extreme concentration of component elements; it must also indicate the country of origin and the postage paid. Ironically, the perforation introduced in the 1850s instantly defines the item as a stamp.

The stamp, however, must convey other messages both representative and commemorative. It must represent the country of origin in a way which is more visible and evocative than just the name of the jurisdiction. The commemorative function is usually signalled by a somewhat larger format.

As stamp designers we continue to search for the best means of presenting positively the history, tradition, ideologies and heritage of our nation. We adopt, modify or renew the solutions of our predecessors, guided by the richness and longevity of certain design conventions.

We continue to offer our customers and collectors a range of poetic visions of Ireland's Fauna and Flora, in addition to the tiny format these stamps work like a microcosm, offering a vision of the universe in which cultural and natural essences are concentrated.

Ironically Ireland came late to the representation of our natural heritage. It was not until 1968 that the country's second Definitive (Everyday) series, which depicted four animals, a Dog, a Stag, a Winged Ox and an Eagle, was issued. The images were based on motifs from early Irish Art and were designed by German designer Heinrich Gerl. The graphic design style of these stamps incorporated Celtic Art on strong single colour backgrounds.



1978 saw the issue of the inaugural 'Fauna and Flora' series. Specialised Botanical painter Wendy Walsh created four beautiful paintings of flowers overlaid against a stark white background. Botanical painting is highly specialised. It is precise, demanding practice, patience, immense artistry, obvious genius and a natural appreciation of the genius in the ordi-

nary. Wendy Walsh had all of these qualities and she initiated a new era in Irish botanical art and encouraged a later generation of internationally acclaimed artists such as Susan Sex.



In 1997, Irish bird illustrations made up the fifth Definitive issues that spanned the changes of currency from the Irish pound, through dual currency, to the introduction of the euro. Lithographically printed on un-watermarked paper by a number of different printers, the stamps were designed by renowned Irish Artist and Ornithologist Killian Mullarney. These were the first definitives where all values were printed in full colour. The initial birds illustrated were: Magpie, Gannet, Corncrake, Woodpigeon, Kingfisher, Lapwing, Blue tit, Blackbird, Robin, Stonechat, Ringed Plover, Puffin, Song Thrush, Sparrowhawk, Barn Owl, White-fronted Goose, Grey Head Pintail and Shelduck.



In 2004, An Post issued the first phase of stamps in its sixth Definitive series, entitled 'Wild Flowers of Ireland'. A total of 24 stamps were issued over a six-year period. The flowers were beautifully illustrated by eminent botanical artist Susan Sex. Susan is widely regarded as Ireland's finest living orchid artist. She has won several RHS gold medals for her outstanding watercolours and has several landmark publications on Irish orchids. The first phase of the stamp series depicted wild flowers that typically occur in Woodland and Hedgerows. The species included were the Common dog-violet, the Dandelion, the Primrose, the Hawthorn, the



Bluebell, Lords-and-ladies, and the Dog-rose. While the second phase consisted of flowers typically found in the Burren, a unique karst limestone area in Co. Clare. The featured species were the Bloody Crane's-bill, the Irish Orchid, the Fly Orchid, the Mountain Avens, and the Spring Gentian.

Susan also created a set of four stamps in 2006 to celebrate Ireland's 'Native Trees'. The stamps featured the following trees; Sessile Oak, Strawberry-tree, Ash and Yew. Earthy tones on a plain white background was employed to illustrate the trees, and also contained within the design was a detailed sketch of each tree's leaf and seed so that the full beauty and uniqueness of each tree could be appreciated. Crafted using a magnifying visor and sometimes even a microscope, Susan's millimetre-perfect watercolours were truly magnificent.



An Post subsequently issued four stamps in 2009 featuring 'Dragonflies'. The four chosen were the Irish Bluet, the Four-spotted Chaser, the Banded Demoiselle and the Large Red Damselfly. Each was exquisitely illustrated by English artist Ian Loe. Ian's depictions of fauna and flora are featured on stamps from a large number of countries.



2010 saw the issue of four stamps featuring Ireland's 'Birds of Prey' (raptors) as part of its Fauna and Flora series. The stamps were illustrated by Killian Mullarney. Killian's work is precise, skilled and very distinctive. It is also evocative, eloquent and expressive. The species depicted on the stamps were the Buzzard, the Golden Eagle, the Peregrine Falcon and the Merlin.



There is a constant tension between the disciplines of Biological illustration, artistic expression and the use of photography. The former has served mankind so well in the accumulation and dissemination of knowledge; and yet for the last 60 years we have learned so much about nature through photographic and videographic presentation. This trend has been

reflected in the use of photographic imagery during the last five years.

In 2011, four stamps featuring stunning photography by Walter Pfeiffer celebrated 'Ireland's National Parks' – Glencagh National Park in Co Donegal; Ballycroy National Park in Co Mayo; Connemara National Park in Co Galway; The Burren National Park in Co Clare; Wicklow Mountains National Park in Co Wicklow and Killarney National Park in Co Kerry.

In 2010, An Post issued eight stamps for the launch of the eighth Definitive stamp series, entitled 'Irish Animals and Marine Life' illustrating Ireland's biodiversity through its faunal assemblage from the seabed to the mountain top. A total of 40 stamps issued over a five year period. The species issued in the first year were; the Beadlet Anemone, the Squat Lobster, the Cuckoo Wrasse and the Common Frog while a separate first day cover features the Green Huntsman, the Elephant Hawk-moth, the Goldfinch and the Red Deer.



These stamps were designed by Zinc Design Consultants and use contemporary, vibrant photography. One of the essential criteria when selecting images for this definitive series was to attempt to capture an engaging view of the species avoiding the depiction of the whole animal. It was also important that the creatures were depicted in a natural setting rather than placing images on a background that was alien to their own environment. One unusual comment came from a customer who has arachnophobia (fear of spiders); she found that the eight eyes peering out of the stamp caused her some discomfort!

Barney Whelan, Director of Communications and Corporate Affairs, An Post, GPO, Dublin 1, D01 75P2. www.anpost.ie



Nature's Web

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

www.naturesweb.ie

Produced by Sherkin Island Marine Station

Recreational Angling supports Jobs in Rural Areas

By Ciaran Byrne

RECREATIONAL angling is a ubiquitous sport, and uniquely, it can be practiced at almost any age, from 4 right up to 104. You can go angling in every county in Ireland and there are angling opportunities right throughout the year. Another benefit of recreational angling is that all skill levels are catered for, from the rank amateur's who only want to catch 'a fish' right up to the specimen hunters who want to bag a specimen of their particular favourite species.

Inland Fisheries Ireland in their seminal research on the socio economic economics of recreational angling in Ireland published in July 2013 identified that up to 406,000 individuals participated in recreational angling in 2012 and of these 252,000 were Irish adults. This equates to 7% of the population. This report estimated that angling supported approximately 10,000 jobs and was worth €555 million in direct expenditure and €755 million when the overall expenditure was taken into account. These figures have recently been updated by IFI following a Millward Browne Omnibus Survey (commissioned by IFI and designed with our research partners in the Economic and Social Research Institute (ESRI) and The Socio-Economic Marine Research Unit (SEMRU) of National University of Ireland Galway (NUIG)) taken between December 2014 and March 2015 and updated Fáilte Ireland/Tourism Ireland visitor figures. Domestic angler participation during 2014 was 7.6% of the adult population while overseas visitors was estimated to increase from 118,000 to 132,000 in the same year. The updated estimate for the contri-

bution of recreational angling to Ireland's economy is €836 million and supports in excess of 11300 jobs.

There have been volumes of research undertaken in different jurisdictions into the value of all types of recreational angling. For example in their 2010 report researchers from the 'Instituto de Investigaciones en Ciencias Economicas de Universidad de Costa Rica' estimated sport fishing to be worth \$599 million or 2.1% of the country's GDP to Costa Rica in 2008. In a 2013 report the Australian National Centre for Ocean Resources and Security identified that in the province of New South Wales alone there were an estimated 773,000 anglers and they contributed ASS1.625 billion on direct expenditure (travel, tackle, etc) and throughout the whole state recreational angling generated an economic output of ASS3.42 billion and supported 14,254 jobs. Closer to home in a 2013 report on the economic value of sea angling in the UK the Department of Rural Affairs (DEFRA) identified that there were 884,000 sea anglers in the UK with 2% of all UK adults going sea angling. They estimated the spend on sea angling in 2012 to be approximately £1.23 billion (equivalent to £831 million direct spend once imports and taxes had been excluded) and supporting 10,400 full time jobs. Arlinghaus & Cook in their 2009 paper estimated that angling participation rates relative to the total population across countries with reliable records was about 10.6 ± 6.1%. To put it a different way they estimated that there were approximately 140 million recreational anglers in the three most industrialised continents of Europe, USA and Oceania.

The social impacts of angling have also been reported on in the UK in



Image courtesy of Inland Fisheries Ireland

Angling is particularly important for Ireland as for the most part the economic activity generated by anglers is done in rural areas.

2012 in the 'Fishing for Answers' The full report is available at <http://resources.anglingresearch.org.uk/sites/resources.anglingresearch.org.uk/files/Final%20report.pdf> and notes real social, environmental and economic impacts.

The research suggests that angling is about volunteering – to run clubs and associations. It is about business

and consumption – of the myriad magazines, websites and forums, tackle providers, TV programmes and DVDs. It is about working to clean up the environment – along rivers and beaches, improving habitats so that biodiversity (including fish) can thrive.

Angling gets people involved in teaching and coaching – where young people learn not just about going fishing but also the life cycles and habitats of species. It is about the engagement of excluded young people – leading to their ongoing personal and social development. It involves travel and tourism – helping to sustain rural areas. And it involves family, friendships, social interaction and debate.

Thus, I believe it is reasonable to conclude there are a lot of anglers and they generate a lot of economic activity. This is particularly important for Ireland as for the most part the economic activity generated by anglers is done in rural areas, where there is little or no prospect of having larger enterprises or the much sought after, and appreciated, foreign direct investment. In a recent UN Report on a better urban future, Dr Joan Clos the Executive Director of the UN Habitat programme stated

“there are four mega-trends that are making our modern society. The first two are omnipresent globalisation and information and communication technology. The latter is often referred to as one of the

main driving forces of the new economy. The third is climate change and finally, the trend less spoken about but most profound in its impact on the way we live: urbanisation and the growth of cities.”

This statement is particularly true of Ireland, where the greater Dublin area accounts for approximately 30% of the population and 40% of the economic output. Thus the challenge is to identify sustainable industries which can provide economic opportunities outside of the large urban centres. Recreational angling fits this bill. However good angling does not happen by accident and just like any other asset it requires investment. Could you imagine building a motorway and never maintaining it? The outcome of this would be that asset would not perform to its optimal level. Angling is no different. Without investment there would still be fish in our rivers and lakes, but without investment the angling product will not perform to its optimal level.

It is in this broader context that IFI have developed the National Strategy for Angling Development. This plan aims to secure an investment of €25 million between 2016 and 2020 and significantly improve our angling assets with the aim of generating additional sustainable economic impacts in rural communities. This plan aims to bring Ireland back to the 1999 levels of participation which were the highest ever recorded, and came on the back of the Tourism Angling Measure which was €17 million investment in angling. This strategy if implemented is capable of growing the value of angling by up to €50 million annually through increased tourist and domestic angling participation.

The strategy focuses on three key strategic objectives, making angling more accessible & attractive by better information, infrastructure and supports. Increasing the number of tourists participating in angling through the promotion of the resource, currently 2% of all tourists participate in angling there is no doubt scope to improve this figure but this will only happen with adequate investment, and the third strand is finally improving the recognition of angling as a key leisure recreational activity. This involves widening the scope of angling activity and marketing and promoting it to a wider group of people as a core outdoor recreational activity. The plan is available on the IFI website (www.fisheriesireland.ie) and the public consultation on the plan is open until the 4th of January.

Dr Ciaran Byrne, Chief Executive Officer, Inland Fisheries Ireland, Swords Business Campus, Swords, Co. Dublin, Ireland.
www.fisheriesireland.ie



Dubliner Cheesy Chicken and Spinach Sweet Potatoes

Serves 4

Ingredients:

- 3 sweet potatoes, washed
- 2 chicken fillets
- 4 tbsp olive oil
- Juice from 1 lime
- 4 garlic cloves, crushed
- 1 tsp cumin
- 1 tsp chilli flakes
- Salt and black pepper
- 150g frozen spinach, thawed
- 120g Dubliner Vintage Cheese, grated

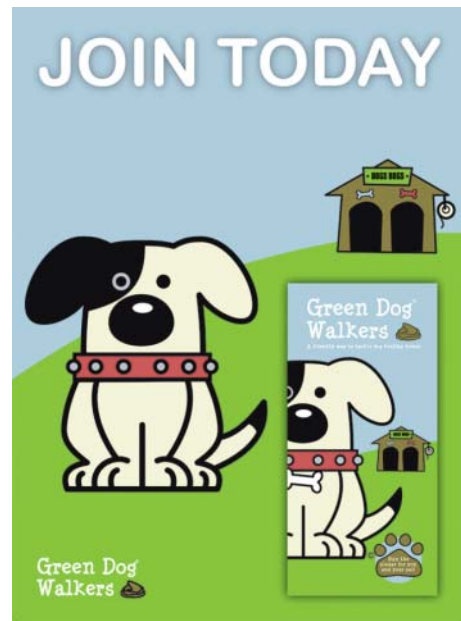
Method:

1. Preheat the oven to 180°C/160°C/gas mark 4.
2. Prick each sweet potato a few times with a fork. Place them on a baking tray and bake for an hour, or until tender. When ready, cut them in half and allow to cool.
3. When the potatoes are halfway through cooking, place the chicken fillets in a baking dish. Rub them with olive oil and season with salt and pepper. Add them to the oven for 30 minutes or until fully cooked, then use two forks to shred them. Cover with tin foil and set aside.
4. In a small bowl, combine the olive oil, lime juice, garlic, cumin, chilli flakes, salt and pepper. Set aside.
5. Put the spinach in a strainer and use clean hands to squeeze out all the excess water.
6. Turn the oven up to 200°C/180°C/gas mark 6. Use a spoon to scoop out the flesh of the sweet potatoes, leaving a ½cm layer intact so that the skins keep their shape.
7. In a bowl, mix the spinach, chicken, the lime and garlic oil and two-thirds of the Dubliner Cheese. Stuff the sweet potato skins with the chicken mixture. Top them with the remaining Dubliner Cheese and bake for 15 minutes or until the cheese has melted and the skins are hot and crisp. Serve with a green salad.




www.dublinercheese.ie

For more details on the Dubliner or Carbery Cheese range, contact Carbery today: Phone: (023) 8822200 | Email: dublinercheese@carbery.com



Pilot initiatives were held in June in Castlelyons, North Cork and again in October in Cobh Town – a recent winner of Gold Medal in National Tidy Towns Award's. The response is very good and the initiative well received by the public.

The pilots involved partnering with community groups like Tidy Towns and Development Councils. Awareness events were held in key locations in their localities i.e. the Foot Way amenity walk linking Cobh to Whitepoint strand. An information booth was assembled and large-scale promotional posters advertising the green dog walker campaign erected on the pathway. Local school children, both primary and transition year, assisted manning the information booth. The public walking their dogs were greeted by the volunteers and invited to sign the pledge, to clean up after their dog, always bring a waste poo bag and dispose of the waste poo bag in a bin. The Council's Dog Warden was on hand to talk through the requirement for dog licences and new micro chipping rules and all the legal requirement of maintaining a dog, including the potential fines for dog fouling.

CORK COUNTY COUNCIL'S Environmental Awareness and Research Unit is spear heading a community lead initiative on dog fouling and much needed behavioural change of our dog owners.

The initiative called Green Dog Walkers Campaign is under licence from Falkirk Council in Scotland who originally designed the project. Cork County Council is running this initiative County wide from November. The official launch was at the Regional Park Ballincollig on Friday 4th December, with Ballincollig Tidy Towns and Cork Council Veterinary staff.

Green Dog Walkers (GDW) is a non-confrontational, friendly way to change attitudes about dog fouling. Volunteers wear a GDW badge which signifies that they have "Taken the Pledge" to always:

- Clean up after their dog's poo.

- Always bring a waste poo bag.
- Dispose of the waste poo bag in a bin.

The initiative is being run under the guidance of Dr Mary Stack, Senior Scientist with Cork County Council and has responsibility for implementing the Council's environmental awareness strategy and heads up the Environmental Awareness and Research Unit established in 2005.

Dr Stack says "Green Dog Walking is going Countywide with schools and local communities getting involved.

So how can the public get involved and what exactly is Dr Stack requesting dog owners and communities to do.

"Our Green Dog Walkers Badge may be worn by the dog or owners and volunteers. It will act as A Friendly Reminder to please pick up after your Dog"

We encourage dog walkers and volunteers:-

- To carry extra dog waste bags.
- Be happy to be approached to 'lend' a dog waste bag to those without a bag.
- Be a friendly reminder to other dog walkers to clean up after their dogs.



The launch of the "Green Dog Walkers" promotion at the Fota Wildlife Park Green Weekend, Cobh, Co Cork.

County but throughout Ireland that people are taking the trouble to put their dog's poo in a bag, but then they are leaving the bags on the ground, in shrubs, up in tree branches, hanging off rails or dumped in the tide.

As the Council increases both public awareness and continues to enforce littering offences to try to get to the bottom of this puzzling behaviour, the Green Dog Walkers Project is raising awareness that ANY BAG and ANY bin may be used by the general public on amenity walkways, parks and recre-

ational areas countywide. The Councils campaign will cover radio and cinema and local press from now to Christmas. The Council environmental awareness unit has partnered with Annette McNelis of ETM Educational Resource Sales, <http://www.environmentthemusical.ie/> who wrote the wonderfully entertaining song "Dog Poo" – which can be viewed on YOUTUBE. Annette is a composer and from Inishowen Peninsula of County Donegal. She had developed creative music workshops for schools and community and adult groups

throughout the Donegal region and has launched a resource pack for schools called *Environment the Musical*. The pack teaches children the consequences of litter through musical classes.

If you would like more information on the Green Dog Walkers Project you may contact EARU section on earu@corkcoco.ie or greenogwalker@corkcoco.ie or download our pledge form online at the Environment Section of www.corkcoco.ie.

WHAT KIND OF DOG OWNER ARE YOU?

RESPONSIBLE DOG OWNERS:

- Support our Green Dog Walkers Campaign
- Always carry a bag to clean up
- Bag it and bin it
- Never let your dog out alone
- Have a dog licence
- Identify your dog - get it chipped
- Don't spread disease - have your dog wormed



Remember, You Can Use Any Bag and Any Public Bin



JOIN THE GREEN DOG WALKERS CAMPAIGN www.corkcoco.ie/environment
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GEOSCIENCE IRELAND

A Different G2B (Government-to-Business) Model

By Andrew Gaynor

GEOSCIENCE IRELAND (GI) is an integrated natural resources organisation, supported by the Geological Survey of Ireland (GSI) and Enterprise Ireland, bringing expertise in water, minerals, environment and infrastructure to global clients. Its international experience has been built through working on projects in over 50 countries around the world. Membership comprises 24 companies which between them employ over 1,250 persons with a turnover of €250 million.

Development of Geoscience Ireland

The idea for Geoscience Ireland was born with the objective of creating jobs and stimulating economic growth in the geoscience industry. In early 2011, a reference group of five companies came together to advance the project. In late 2012, Sean Finlay was appointed Director of

Business Development for GI to develop the initiative by means of targeting and researching markets, building linkages and networks, and tracking tender opportunities in international markets. Since then, the group has grown to 24 companies, offering the services in:

Geological Consultancy (2 companies) | Geophysical Surveys (2) | Hydrogeology (4) | Geotechnical Engineering (4) | Ground Investigation & Mineral Exploration (4) | Civil Engineering (4) | Mining Contractors (2) | 1 each of Lining Technology, Surveying, Pavement Management & Ground Support.

Structure

The model for supporting Geoscience Ireland (GI) differs from most Government to Business (G2B) methods; the support is delivered from the Geological Survey of Ireland (GSI) – part of the Department of Communications, Energy and Natural Resources – to a business cluster which is

largely autonomous. The support is designed to provide market research and intelligence, tender tracking and collaboration between the member companies.

The GI Team consists of Sean Finlay (Director) and Andrew Gaynor (Business Development Executives) based in GSI's office in Dublin; GSI provides administrative, promotional and marketing support. GI also has a Panel of Individual Experts, which is capable of supporting and assisting Member Companies in tendering and delivering projects, the Panel comprises of persons with experience in technical, scientific, financial, legal and training roles.

GI supports applied research and development in raw materials through the Science Foundation of Ireland iCRAG initiative and is represented on Technical Advisory Committees which direct this work.

Our members are bound by the Code of Ethics of the Institute of Geologists of Ireland,

or equivalent professional organisations (e.g. Engineers Ireland), and are committed to develop the resources of our international clients to a standard that is environmentally and socially responsible.

Doing Business

GI participate in several Enterprise Ireland (EI) and Department of Foreign Affairs Market Study Visits and Trade Missions to key development regions including Western and South Africa (in tandem with Mining Indaba 2014 and 2015), Sweden, Australia and the Gulf. GI regularly attend EI sponsored events across the UK and Ireland.

As well as developing and acting on these connections, the GI Team track tender opportunities posted by multi-lateral development agencies including the World Bank, the European Bank for Reconstruction and Development, the European Investment Bank and the associated agencies of the United Nations and the European Commission. Coupled with developing connections with larger Irish companies operating overseas, the GI team continue to develop a route to market for GI Member Companies.

GI, as part of an all-island trade promotion exercise, also attends the annual Prospectors & Developers Association of Canada (PDAC) in Toronto which attracts 25,000 delegates.

Case studies

The following is a selection of case studies highlighting the diversity of GI's expertise and the global reach of their projects. The Geoscience Ireland website [www.geoscience.ie] case study library is regularly updated with GI Member Company projects.

Future Directions

Since September 2012, GI Member Companies have created over 250 net new jobs in the geoscience sector.

The future direction of Geoscience Ireland will draw on the sustained cooperation and participation of its Member Companies. GI will continue to grow due to the strengths of Irish knowledge abroad; whether through the historical projects and connections of GI Member Companies, larger



Technical Assistance on the Implementation Capacity of the Seveso II Directive in Turkey by AWN Consulting



Morogoro Water Supply Scheme by Nicholas O'Dwyer Consulting Engineers. Upgrading and expansion of the water supply system serving the town of Morogoro, Tanzania



Soil and groundwater management procedures for oil industry construction; Caucasus Region by Verde Environmental



Construction, Supervision & Technical Assistance at Luluburgaz, Turkey. Elimination of pollution of the Eugene River and compliance with the EU Urban Wastewater Directive by J.B. Barry & Partners.



Two large Open Loop Geothermal wells in County Durham, UK by Meehan Drilling



Mining, Socio-Environmental, Metallurgical, Geological, Financial & Social Auditing of international gold mines, Mali by SLR Consulting.

Irish companies who successfully gained traction overseas through state agencies and the strong networks develop by Enterprise Ireland in international markets.

The challenge for GI, as a government-to-business (G2B) template, is to develop high-level linkages and gain traction overseas amongst government

bodies and multi-lateral organisations in a manner that will continue to bring tendering success, thus allowing for continued employment and economic growth in the geoscience industry. DCENR in its Strategic Plan for 2015–2017 envisages that GI member companies will create 100 new jobs.



Marine Harvest currently employs 260 staff in the West of Ireland, supporting local communities in rural coastal areas to produce the finest salmon in the world, which is proudly presented to customers all around the world.

The company has plans to double its business and employment over the next five years subject to new aquaculture licenses.

Marine Harvest Ireland has two brands,
The Organic Salmon Company and Donegal Silver




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Marine Harvest Ireland, Rinmore, Fanad, Co Donegal
E: Irishsales@marineharvest.com T: 00353 (0) 749192820 F: 00353 (0) 749192825






Seafood Exporter of the Year 2010

By Matthew Jebb

TODAY we think of the dodo as a poster child of extinction and obsolescence. It took just 80 odd years after the discovery of Mauritius by Dutch Sailors in 1598 for these naïve birds, that had no predators to speak of, to disappear. Mariners, deprived of fresh meat, hunted the bird for supplies but it seems that their true nemesis were the introduced pigs, monkeys and rats that destroyed their ability to hatch eggs or raise young. Such a tale of human destruction has been repeated in islands around the world. Indeed the website for the Convention on Biological Diversity tells us that "Invasive aliens are considered to be one of the main direct drivers of biodiversity loss across the globe". They also claim that alien species have been estimated to cost the global economy hundreds of billions of dollars each year.

In August this year invasive alien plants hit the headlines here, mostly with talk of the scourge of Japanese Knotweed and plenty of shocking sound bites about mortgage refusals and the colossal potential costs of eradicating it from the Irish countryside. Some newspapers reported that the potential cost of clearing knotweed from the 10 acre site of the London Olympics had cost anything between £7 and £70 million – depending upon the website or paper. This figure probably ignored the major thrust of that work which was removing centuries of pollutants and rehabilitating the soils. Other organisations had estimated the cost of trying to eradicate the plant in the UK might run into billions of pounds sterling. These are dramatic figures but how real are they? Is the menace we face really that bad?

A recently published paper by two British researchers (Thomas & Palmer 2015) carried the provocative title "Non-native plants add to the British flora without negative consequences for native diversity". They compared plant occurrence and cover at nearly 480 sites in the UK between two data sets from 1990 and 2007. They found that changes were dominated by the native species, and the idea that the 'invasive' species were displacing native plants was not supported. They concluded that factors other than plant invasions were the key drivers of vegetation change. Furthermore they also found that the diversity of native species actually increased in

locations where the diversity of non-native species was increasing, suggesting that high diversities of native and non-native plant species were compatible with one another.

This year Fred Pearce published another of his quirky books on global environmental issues: "The New Wild: Why Invasive Species Will Be Nature's Salvation". Pearce, a New Scientist stalwart, has written extensively on climate change, as well as books titled "Confessions of an Eco-Sinner" and "The Land Grabbers" both thoughtful and refreshing books that challenge the orthodox and political correctness of farming, subsidies and sweat shops.

You would be forgiven for being confused. It all sounds like the debate over man-induced climate change again – two competing lobby groups demanding your attention. Why would objective scientists take these opposite points of view? The fact is that many plants that have hopped the garden wall are fairly innocuous. In fact the danger of brambles and nettles swamping our native flora is probably as great a risk, and largely brought about by increased nutrient run off. Fuchsia is a fine example of a plant that has become more Irish, symbolically, than much of our native flora. But there can be little doubt that some new plants are far more aggressive in asserting themselves on the landscape. *Rhododendron ponticum*, Japanese Knotweed, *Gunnera tinctoria* and the South African waterweed, *Lagarosiphon major*, are plants we must not be complacent about.

The National Botanic Gardens has been much involved with the 'war' on Invasive Aliens over the past 10 years and we have tried to wage this proportionately and judiciously. For example we looked to the south-east of England where Hottentot Fig (*Carpobrotus edulis*) is a scourge of cliffs on much of the Lizard Peninsula and decided that a stitch in time would pay dividends. In 2010 we received funding from the Heritage Council to tackle Hottentot Fig on Howth Head. Noeleen Smyth and Andy Booth did sterling work spraying large quantities of herbicide on several acres of plants. It was certainly effective in that native plants returned in abundance and on balance, we believe it was the right thing to do.

The five big drivers of biodiversity loss across the globe are habitat loss and degradation, invasive alien species, overuse of resources and pollution. The fact is we can (if

Images courtesy of National Botanic Gardens



Hottentot Fig *Carpobrotus* on Howth Head, before treatment.



Gunnera on Achill Island in winter.



Carpobrotus on Howth Head after treatment with Golden Samphire returning in droves.



Gunnera at Doega on Achill Island.

we want to) stop clearing habitats, overexploiting resources and clear up pollution. These are all reversible impacts, but the tenacity of living organisms often means that it can be virtually impossible to remove an alien species once it has become established. Acting early in this battle is the most cost effective way of dealing with the problem.

Matthew Jebb, Director, National Botanic Gardens, Glasnevin, Dublin 9.

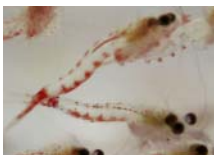
Reference

Thomas C.D. & Palmer G. 2015. Non-native plants add to the British flora without negative consequences for native diversity. *Proceedings of the National Academy of Sciences* 112: 4387-4392.

Image by Marlene Peck



Joe Caffrey educating youngsters.



Hemimysis anomala - Bloody Red Shrimp.



Asian clams.



South African waterweed *Lagarosiphon major* on L. Corrib.

Image by Christine Armstrong

Identification Guide to Ireland's Grasses

By Una Fitzpatrick, Lynda Weeks and Mark Wright
National Biodiversity Data Centre

www.biodiversityireland.ie
2014/€15.00

This a most useful, concise and informative guide to the 100 Irish grasses. All species, native and established introductions are included, apart from some casual or scarcely established aliens. A brief introduction looks at the vegetative and floral structures of grasses, hence straight into seven identification sections. These are based on the inflorescence (e.g. "inflorescence 1-sided", "inflorescence a diffuse spike"); species falling into each section are listed; and photos and identifying features are provided in 2-page spreads for each species or related species group. Notes are included on key identifying features, flowering period, habitat and distribution in Ireland. Clear colour photographs portray habit and details of the various grasses.

The second part of the book is a vegetative key to grasses, again divided into helpful sections, six in all. This key is remarkably easy to use and avoids jargon and complexity. It is this straightforward approach that makes this book so practical and valuable. Stoutly ring-bound, with laminated pages, it is genuinely pocket-sized.

There is a short list of other recommended grass keys and guides. It is good to see listed here C. Hubbard's 1984 book *Grasses*, substantially the same as the classic original edition published over half a century ago. That and the present work makes an excellent pair of reference books for anyone, especially non-botanists, wanting to know more about iden-

tifying grasses. [John, this sounds like you are recommending the old and new version of the *Grasses* – not the book being reviewed?]

Hopefully *Identification Guide to Ireland's Grasses* may be the start of a series of similar books, perhaps for other groups such as sedges, or even for particular habitats.

John Akeroyd

Hybrid Flora of the British Isles

Clive A. Stace, Chris D. Preston & David A. Pearman
Botanical Society of Britain and Ireland

www.bsbi.org.uk
ISBN: 978-0-901158-48-2
Price: £45.00 stg / 2015

The first edition of the *Hybrid Flora of the British Isles* (Clive A. Stace, Academic Press, 1975) marked a milestone in the study of interspecific plant hybrids in Britain and Ireland, in that it listed 626 hybrids, and provided new identification data on most of these taxa. Not surprisingly, over the past forty years this work has proved an indispensable reference source for anyone studying the hybrid flora of these islands. Most gratifyingly, 2015 has seen the launch of the second edition of this work – a magnificent, aesthetically pleasing volume, that is much larger-dimensioned than the origin work, and provides detailed diagnostic, biological and distributional data on 909 interspecific



hybrids, in addition to a selection of colour photographs and distribution maps. Brief notes are also provided in the text, on a further 156 hybrids, some of which are doubtfully recorded in the wild, or which are not as yet sufficiently well-established in the wild to merit a detailed treatment in the book.

In the Introduction, the authors' tellingly comment that: "Today there are far fewer professional taxonomists in our institutions (Universities, Museums, etc.), and also fewer expert amateur taxonomists than there were in 1975, such is the fall in fortunes of funded taxonomy". In the original work, Clive Stace was assisted by 85 contributors, whereas in the present work only 31 specialists (amateur and professional) contributed. Therefore, for many of the taxa, Stace, by default, collated the data dealing with nomenclature, diagnostic characters, references to illustration(s), chromosome numbers, data on fertility/sterility, and experimental work (varying from attempts to resynthesise the hybrid, to molecular investigations).

For far too long, interspecific plant hybrids have received 'Cinderella' treatment, and many botanists still shy away from studying them, given the known difficulties of recognition of many hybrid taxa. Yet it is becoming increasingly evident that hybrids play a major role in plant evolution, so it is essential that this reluctance to tackle them be overcome – hence the inestimable value to the botanical community of the present taxonomic work. Moreover, it is a truism that the accurate determination of hybrid taxa demands an intimate knowledge of the diagnostic characters of their parent species, and thus

helps to greatly improve the standard of plant recording in general.

This second edition of the *Hybrid Flora of the British Isles* is a magnificent achievement, and all involved in its production are to be congratulated and thanked for their valiant efforts on behalf of the BSBI. It will undoubtedly prove an invaluable reference source for decades to come. Buy a copy!

Tony O'Mahony

A Photographic Guide to Common Seaweeds

by Lin Baldock & Jenny Mallinson

£20.00 stg plus postage

For details contact:
lin_m_baldock@btinternet.com



This photographic guide provides a brief overview to the key seaweed species found around the British Isles and is a useful identification guide for use on the seashore.

The book is broken down into three main chapters separating the three main phyla of seaweeds, the greens (Chlorophyta), browns (Phaeophyceae) and red seaweeds (Rhodophyta), making the book easy to use. Further aiding the user, the species in each section are not grouped alphabetically but by type and growth form i.e. filamentous, large and bushy or calcareous etc. which is very useful to aid the identification of species.

The beginning of the guide includes an index which contains both English and Scientific names

to aid the search for specific species. One large positive about this book, also at the beginning of the guide, is the glossary, which not only includes terms but photos so that the user can clearly understand the terminology used in the book and to aid with identification.

Each seaweed species within the book is given a small description and is accompanied by a variety of photos, which is what makes this book particularly useful and sets it apart from other identification guides. It provides photos of the species in its natural habitat, in pressed form and with some of the smaller species also includes photo of the cells, which is essential for microscope identification of certain species, which gives you the best chance of identifying the species by clearly showing the main features.

Overall this is a very useful guide, and something that we would recommend. It is very easy to use, well set out, and gives clear pictures of each of the species included. It can be used by anyone, even someone with a basic knowledge of seaweeds, but can also be of use to the more experienced taxonomist.

Vicky West, Inês Dias & Yolanda Aze

Britain's Butterflies A field guide to the butterflies of Britain and Ireland

David Newland, Robert Still, Andy Swash, David Tomlinson

Princeton University Press
www.press.princeton.edu
ISBN 978 0 691 16643 8

\$25.95/£17.95 stg/Euro26.99



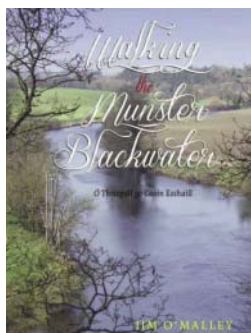
The extensive introductory section of this lovely book details the biology of butterflies, their food plants, which species hibernate in winter, which migrate from abroad, and the habitats, hedgerows, heaths, farmlands, woodlands etc. in which they may be found.

The main section devotes two pages to each of the 59 species that comprise the 5 families commonly found in Britain and Ireland, and a further 12 that occasionally appear on these shores. The left-hand page contains concise, but comprehensive information consisting of a distribution map, wingspan measurement, life cycle chart, adult identification features, behaviour and breeding habits. The right-hand page is devoted to photographic images of the male and female adults of each species, which are of uniformly superb quality, making identification extremely easy. The standardised format allows for ready comparison between species.

The last section, also quite substantial, comprises equally excellent images of the eggs, caterpillars and chrysalises of each species and the caterpillar food plants, together with a table of nectar sources for the adults.

This beautifully produced book, rather than being just an identification guide, is more a reference work for both the enthusiastic amateur and the expert.

Tony Toole



Walking the Munster Blackwater Ó Thiopail go Caoim Eochail

By Jim O'Malley

ISBN: 978 1 901658 96 5
www.ashfieldpress.ie
2015 / Price €20.00

The author has fulfilled a long-standing ambition to walk the course of the Munster Blackwater from source to the Sea, not by road but along its banks. It brought him through woodland, rough pasture and lush farmland, avoiding electric fences, bulls, bushes and briars. The

journey of 104 miles, which took seven days to complete, is the subject of this book. Through his encounters with farmers, anglers, publicans and customers, B&B owners and local historians we get a wonderful insight into the history, geography and literature of the villages, towns and townlands along the river.

We are introduced to the source of the mighty river itself as a tiny trickle in the townland of Muingainne on the slopes of Knockaneune (438m), some five miles north of the village of Ballydesmond. The Desmond rebellion of the late 16th century is synonymous with the area. It was here that the Earl was beheaded and his head sent for display on London Bridge. It is also part of an extended area of Cork and Kerry that is best known as Sliabh Luachra, which is famous for its traditional Irish music. Nora Herlihy, founder of the nationwide Credit Union movement throughout Ireland, was also born locally in 1910.

The author's journey through these parts was difficult. At one stage he fell into a muddy drain, tore his trousers on barbed wire and lost his camera. However, the trial and tribulations of the journey were balanced by the author's odd encounter with farmers. On one occasion he met two farmers as he made his way through the fields. Naturally they were troubled as to why he was crossing the farm so he told them of his long-held dream to walk the course of the River Blackwater and that he

was a Corkman but married and domicile in the Kingdom (Kerry).

He was asked "Who are you going to cheer for in the All-Ireland?" and as he stood there on the Cork side of the border he gave an inspired answer "What colour is my blood (red being the Cork colours)?" That alleviated any tensions there might have been!

As I turned page after page of this fascinating book, I learned so much of the history of this river and its surrounding areas. Memories abound for me as I organised canoe-camping holidays on the river for a dozen or so years in the 1950s and 1960s.

As the author crosses each bridge, I not only remember canoeing under them but can pick out the various local landmarks he describes. For example, at Duncannon Bridge, he passed near Rathmore the home of Cadbury's Chocolate Crumb Factory and continued on following a geological Fault Zone that extensive from Dingle to Dungarvan and beyond to Germany.

We lived 200 yards or so from Colthrust Bridge near Rathcoole, next to the huge field that became the airstrip.

The author's account of Duarrigle Castle, now a ruin and the former home of Madam Halkiopulos (whose maiden name was O'Callaghan), also brought back memories. She was a larger than life character and a distant relation on my mother's side. Madame would visit us in

Cork City in the 1940s, arriving at our house near the North Infirmary Hospital on a horse drawn side car, dressed in a fur coat. She would greet us on the footpath saying "kiss me darling" and putting her arms around us. Need I add I used wish the ground would open up before me as Madame's arrival would always draw a crowd of local children.

At times I questioned the author's sanity, particularly when I read: "Having taken off my sodden boots I drew away the bilge and wrung my walking socks. I decided to walk barefoot across this rough pasture of thistles and coarse grass". One must remember Jim is a very young 70 years old! At Banteer a local farmer said "God you'd think a man of your age would have more sense, now wouldn't you". Jim replied "I am only about the same age as yourself."

Banteer has a special place in my heart and I learned so much more about it from the book. It is less than one mile from the Blackwater, which passes through the townland of Ballymaquirk, where I set up my "headquarters" of tents etc. for my canoeing clients. I was delighted that Jim spent some time talking to the now deceased local historian, Con Tarrant. He delighted Jim with wonderful tales of battles, killings, old monasteries, fishing and former pastimes of the locality. He recalled the story of the Black Dog often seen at the Dead Women's Gate near Gurteen Mills. Con told him

that one night at Lam he was fishing and he heard a noise that chilled him to the marrow of his bone, as he feared the Black Dog with the donkey hooves was approaching. To his great relief he discovered that "It was only a courting couple!"

I was intrigued to read about Con's description of the O'Callaghan crypt at nearby Clonmeen cemetery. My grandfather O'Callaghan was buried there in 1954 – another strong connect I have with the area.

Jim packed so much into those seven days and in his book he gives a real glimpse of rural Ireland through his conversations with the locals. As he continues his journey along the Blackwater, his story is interwoven with information on towns, villages and places, such as Mallow, Kilavullen, Bridgetown Priory and Ballyhooley – where the beautiful timber bridge was replaced in later years.

The book is illustrated with over 120 photographs and each day that he walked is accompanied by a map, which illustrates the route he took. These maps by Timmy Flavin help to trace the river from its source all the way to its end at Youghal, and give a focus for the reader as the author traces the river in story. I highly recommend Jim O'Malley's book "Walking the Munster Blackwater".

By Matt Murphy



A review by
Matt Murphy

THIS is a portrait of a most remarkable man – Major Richard Hingston, medical doctor, explorer, naturalist, author, who spent his early life at Passage West, Co. Cork. He graduated from University College Cork in 1913 with a medical degree (MB) and almost immediately he obtained a position in the Indian Medical Services.

The author, Jim Murphy, grew up in Passage West just 100 yards from the house to which Major Hingston retired. He remembered the Major would erect the tents from his Himalayan and Everest adventures in the front lawn of the house. In recent years whilst researching a previous book on the area, Jim got chatting to the major's daughter and her twin brother about the extraordinary life their father had. He felt people should know more

about the important influence Major Hingston had in many fields of science and discovery.

In researching Richard Hingston's vast amount of material, which is in the Manuscript Library of Trinity College, Dublin, he found the Major's own personal diaries, which included the horrors he experienced during World War I.

In 1913 he was seconded to go as a naturalist and medical officer on the Indo-Russian Pamir triangulation mapping in the Himalayas. Almost the entire collection of fauna on it was made by him, many of the rock specimens and plants from the region were also his. He also undertook groundbreaking pioneering work on the effects of high altitude on the human body, which in later years would be a source of help and knowledge, not only for Mount Everest expeditions, but also for the growing aviation industry.

In 1914 the major went on war service and saw action in East Africa and Iraq as a Doctor. He was awarded the Military Cross for gallantry in action "rescuing under close and constant enemy fire of a wounded soldier". His account

Image from "Passage to Everest & Beyond"



Members of the 1924 Mount Everest Expedition; Hazard, Hingston, Sommervell, Beetham, Shebbicare, J.G. Bruce, Norton, Noel and Odell. Mallory & Irvine are missing, as the photo was taken after their demise.



Hingston with traps used to collect insects in the jungle.

of the battle between the British and the Germans at Tanga, German East Africa (now Tanzania) is horrendous. The "hospital" a bungalow with outside sheds full of wounded and dying soldiers, the awful wounds: "bones shattered, fingers blown away, faces mangled out of all recognition formed a never to be forgotten

sight." The operating table was a stretcher and some boxes erected in one of the hospital sheds. Crude surgery had to be performed in full view of all the wounded in the shed.

Extracts from the diaries for the war years in the Middle East and the war with the Germans and their allies. The accounts of the various battles are covered in great details and his work as a doctor includes his journeys on ships as doctor-in-charge to and from Europe. Interestingly when he had spare time on shore he wrote extensively on the natural history of the area and collected specimens. Some pencil and ink sketches of insects are among his war diary notes.

When the war ended the Major remained in service in the Middle East. In 1924 he was invited to join the Mt. Everest expedition team both as a medical officer and naturalist. During the expedition he recorded the fauna and flora that he encountered on both the journey to and from the slopes of Mt. Everest. He collected 10,000 animal (mostly insects) and 500 plant specimens. He refers to the local porters and how the expedition would not have been possible without them. At high altitude they were able to carry burdens of 25 lbs., which the European climbers could not. In fact the expedition virtually ascends the mountain on the backs of these porters.

Mallory and Irvine attempted the summit on June 8th 1924 but never returned. Mallory's body was found 75 years on, in 1999. His body had not decayed much and after subsequent DNA tests a positive identification was made. Hingston's comments on why

the 1924 expedition failed are most interesting.

In 1925 to 1927 he acted as surgeon and naturalist to the marine survey of India on HIMS Investigator. In 1928 he was second-in-command to the Oxford University expedition to Greenland. In the same year he was the organiser and leader of the Oxford University Expedition to British Guiana.

However Major Hingston's greatest achievement came in the 1930s. He was asked by the Society for the Preservation of the Fauna of the Empire to go to Africa to examine the widespread slaughter of the big game animals and the export of ivory. His travels took him to Uganda, Kenya, Tanganyika, Nyasaland, North Rhodesia. His great aim was the establishment of National Parks. What vision he and the other members had. The issue of endangered wildlife is still the nightmare facing Africa today.

Reading the extracts on his visit and discussions with the various Governors and top officers of those countries, he showed the major part he played in getting the Serengeti National Park established. The park,

which is 12,950 sq kilometre in size, is now a UNESCO World Heritage Site and often features in television documentaries about African wildlife.

The work the Major carried out puts him high on the list of great naturalists of the 20th century. I hope that this book will help to give him the recognition he so deserved.

Major Hingston was recalled to military duty in India in 1939, where he remained until the war ended. He then returned to his home in Passage West, Co. Cork and died there on 5th August 1966.

I very much recommend this book. Dr. Jill and Dr. Richard, the children of the Major, who live in Passage West, must be incredibly proud of their father, who was an extraordinary individual who realised that Africa's wildlife needed protecting so many years ago.

Passage to Everest & Beyond
by Jim Murphy.
ISBN: 978-1-910097-27-4.
Write: 8, Pembroke Wood, Passage West, Co. Cork. Email: jamescmurphy@eircom.net. Mobile 087-9630462. Special offer: €25.00 or €30.00 inc. postage in Ireland.

*"Two brave ones scaling the mountain's brow! –
Did they ever reach the goal?
Their fate their comrades ne'er shall know,
Nor the throes of each valiant soul.
They watched them in the steep ascent,
Fraught with a nameless fear, Till lost to sight, and hope nigh spent
That they might re-appear.
They sought the missing ones in vain,
Scaling the mount with care; Weary, disheartened with the strain,
Filled with a dull despair.
They saw (the watchers from below)
A simple cross outspread – Symbol of loss! that they might know
Their comrades brave were dead"*

Extract from, "An Epic of Mount Everest 1924"
by Frances Hingston (Richard's Mother)

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JUNIOR PAGES

Black John the Bogus Pirate

A Story by John Joyce



John Black was a young sign-writer in Baltimore, County Cork when Barbary pirates raided the town in 1631. John was forced to work on one of the pirate ships and his family were taken as slaves to the Caribbean. Things got even worse when he was captured by the Spanish and John was to be brought to Spain in chains on a treasure ship to be hung as a pirate.

With him were other prisoners including 'Smithy' - a mad English shipwright who dreamed of crazy inventions, Zelda - an apprentice voodoo witch who was to be burned at the stake along with her brother Amos who she had accidentally turned into a cat. There was also 'Molly' - a young Spanish lady from the Spanish colonies in the Caribbean being forced to marry an ugly old Duke back in Madrid.

Molly had the idea of tricking the Spanish crew to abandon ship by pretending to set it on fire near the island of Lanzarote. Then John, Molly, Zelda and Smithy, together with Smithy's parrot 'Loppy' who always mixed up his words, sailed back to the Caribbean to find John's family.

But the Spanish captain had heard Loppy call John Black 'Black John' and, to save face at having his ship and its treasure stolen, spread the story that 'Black John' the dangerous pirate had done it. Soon every ship in the Caribbean was searching the seas for 'Black John' to get the gold for themselves.

So Molly told John that the only way to find his family was to pretend he REALLY WAS 'Black John' the dangerous pirate. She made John a false beard to cover his face and stuffed a pillow up his shirt to make him look fierce and strong.

Now 'Black John - the Bogus Pirate' sails the waters of the Caribbean with his rag-tag crew, each with their own personal quest. John wants to find his long lost family. Zelda wants to be a real witch. The Zombies want to be men again. Smithy wants to be famous for his crazy inventions and Molly wants to find someone to love.

Join them on deck of 'The Mucky Duck' for fun, adventure and a new way of looking at the Sea? For more about 'Black John' go to <http://www.spindriftpress.com/childrens-books/black-john-the-bogus-pirate/>



For Fun Facts check out www.spindriftpress.com

Help Zelda Cast Her Spell!

1. Draw Zelda a fish by drawing a curved smile, chubby cheeks, and a nice big eye . . .
2. Then put in the bottom lip and a fat little body curving round to the tail.
3. Draw on the tail, the dorsal fin on top and the pelvic fins below . . . and a nice big bubble !
4. Then colour in your cartoon and you have a friendly fish. Do you think Zelda got it right? Look and see !!!!!

Zelda, the apprentice Voodoo witch, can only cast a proper spell if someone draws her a picture of what the spell has to do - and even then her magic doesn't always work exactly the way she wants it to !!!

Luckily John Black is a good artist and this is how you can learn to draw as well.

Look at yourself in the mirror and watch what happens your mouth, eyes and eyebrows when you make Happy, Sad, Angry and Surprised faces.

Once you know how to draw the four simple faces below, you can make a cartoon character out of ANYTHING!

Try it yourself by copying the four fish that Black John has drawn for Zelda - but don't dare try any magic!

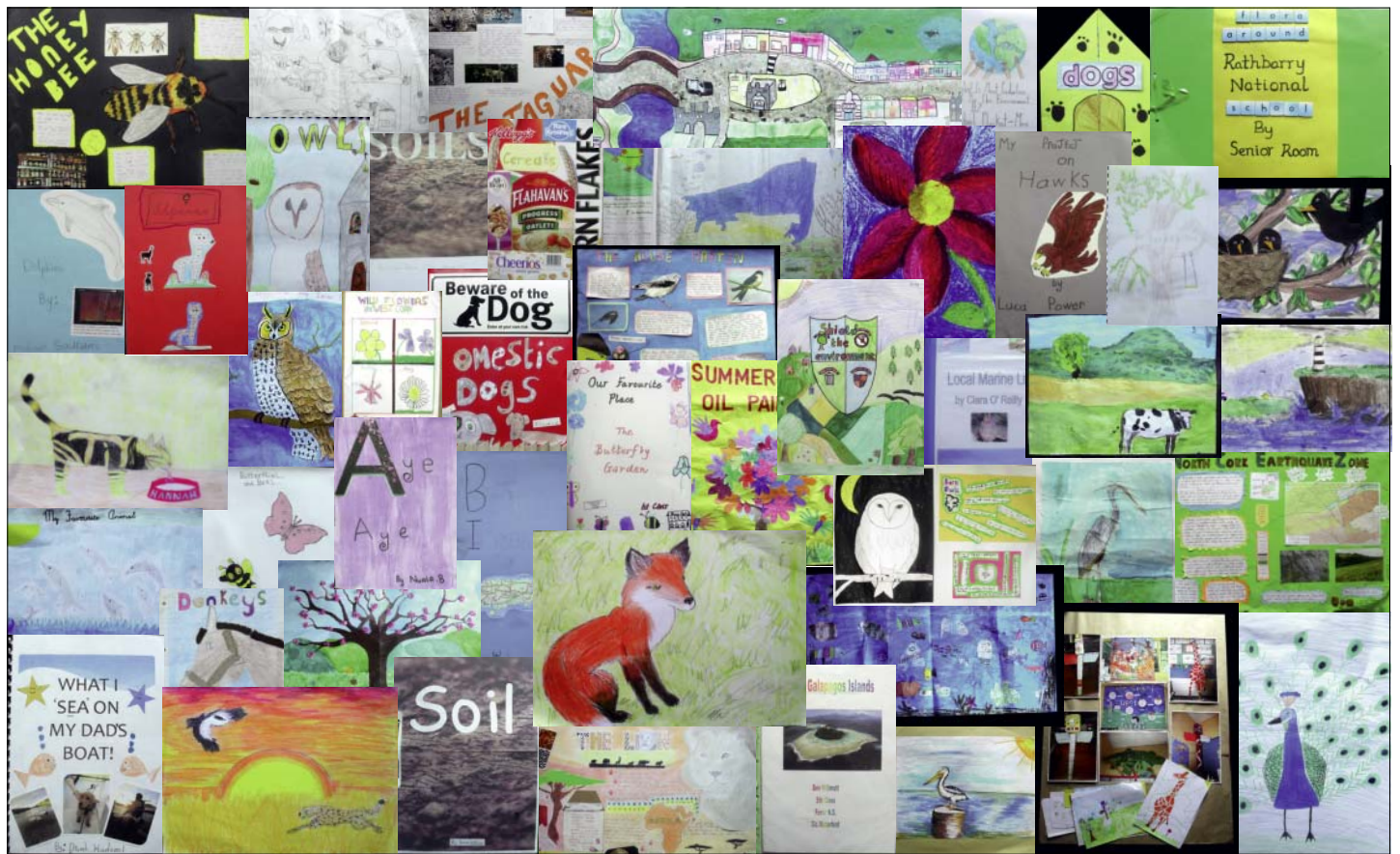


	HAPPY Corners of mouth and eyebrows go UP and eyes are WIDE OPEN.		ANGRY Mouth OPEN (but not in a good way!) so teeth can be seen. Eyebrows dip in the middle, like the wings of a bird.
	SAD Corners of mouth, eyelids and eyebrows go DOWN.		SURPRISED Mouth and eyes are WIDE OPEN - so that you can see tongue - and eyebrows are UP.



A Selection of Winning Entries

Sherkin Island Marine Station's
Environmental Competition for Primary School Children in Munster 2015



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

MAKING CHANGES CAN MAKE A DIFFERENCE

WE ALL create rubbish and waste in our homes. Most of the food and items we buy come in boxes or bags or containers. Items break or go out of fashion and we are left with things we no longer use or want. This packaging, waste and unwanted items used valuable materials to make them in the first place but will also need to be disposed of.

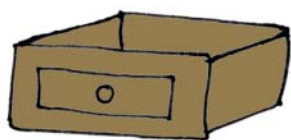
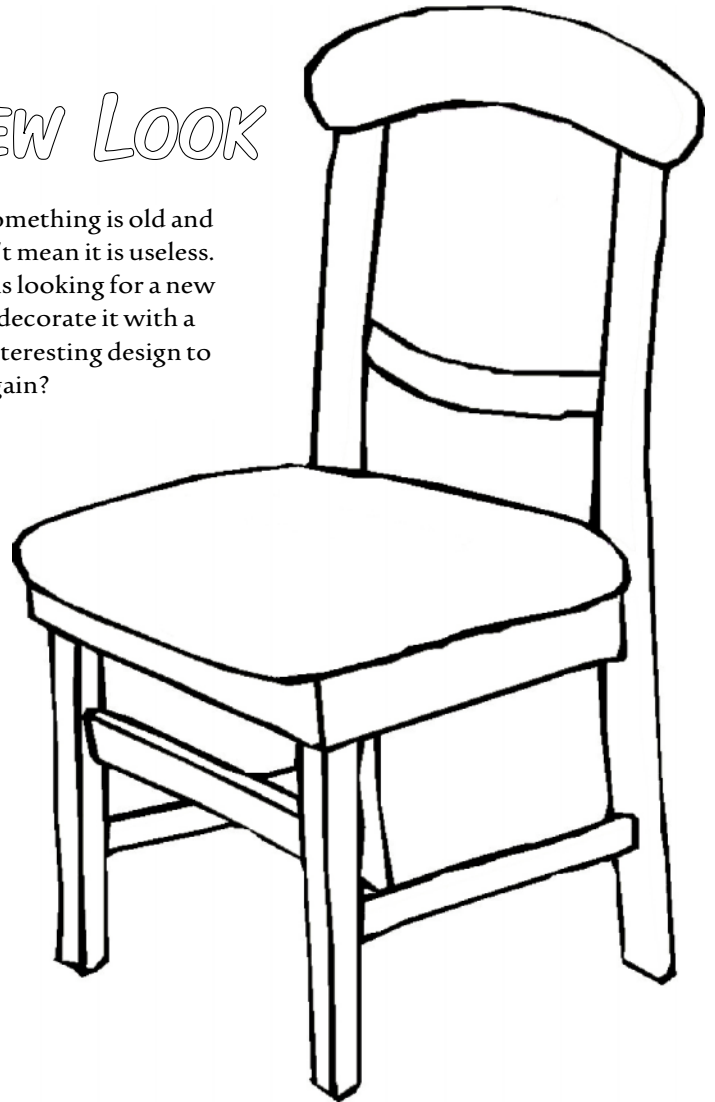
Making small change can make a difference to how much waste you produce in your home. So RETHINK:

- + Can you **REDUCE** the amount of waste you produce in the first place?
- + Can you **REUSE** an item again rather than throwing it away immediately?
- + Can you **REPAIR** an item and get more use from it?
- + Can you **RESTORE** something and make it look fresh and new again?

And if after all those routes have been explored, please **RECYCLE** what materials you can so new products can be made from them.

A NEW LOOK

Just because something is old and shabby, doesn't mean it is useless. This old chair is looking for a new look. Can you decorate it with a colourful or interesting design to make it new again?



Old drawer



Carton



Jar



Plastic carton



Broken teapot



Egg box

UPCYCLE

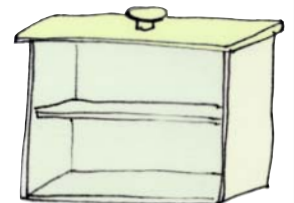
EVERYDAY

ITEMS

Many unwanted everyday items can be upcycled into something useful.



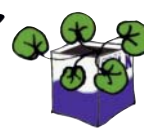
Tea light lamp



Shelves



Shovel



Growing plants



Seed tray



Garden planter

REDUCE, REUSE AND RECYCLE

Here are close-up images of everyday items: some can be reused, some can be recycled and others can help us reduce the energy we use. Can you identify what they are? Once you've filled in the grid below, try to find the words in the wordsearch (answers on page 6).

 RONI	 GEG XBO	 KOBO
 LCTOESH	 BBLU	 YBTRTEA
 CEKTHIN PCARSS	 LSGAS OETBTL	 DRRCBAAOD XOB
 LCSIPTA TTLEBO	 KMLI TRCNOA	 LMNUMAIIU ANC

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

1	2	3	4
5	6	7	8
9	10	11	12

Sherkin Island Marine Station PUBLICATIONS

Free postage on orders of €50.00 or more!

<p>A Beginner's Guide to Ireland's Wild Flowers ISBN-13: 978-1-870492-23-2 SB. 140mm x 100mm (208pp). €7.50 (plus p&p €1.00)</p> <p>A Beginner's Guide to Ireland's Seashore ISBN-13: 978-1-870492-96-6 SB 140mm x 100mm (208pp). €7.00 (plus p&p €1.00)</p> <p>The Natural History of Sherkin Island, West Cork – An Introduction ISBN-13: 978-1-870492-38-6 SB 208 mm x 98 mm (72 pp). €2.00 (plus p&p €1.35)</p> <p>On the Water's Edge €6.00 Special Offer (plus p&p €1.30)</p> <p>An A to Z of Geology ISBN: 978-1-870492-33-1 A4 SB 24pp €5.99 (plus p&p €1.00)</p>	<p>Colour Books A5 (softback) 32pp €1.95 per book (plus p&p .60c) €11.00 for set of 7 (plus p&p €2.00)</p> <p>Ireland's Bird Life ISBN-13: 978-1-870492-80-5 SB A4 (160pp). €14.00 (plus p&p €3.00)</p> <p>The Wild Plants of Sherkin, Cape Clear and adjacent Islands of West Cork ISBN: 1 870492 86 2 SB (206 pp) €6.00 Special Offer (plus p&p €3.00)</p> <p>Supplement ISBN: 978-1-870492-58-4 SB 246mm x 170mm (36pp). €2.50 Special Offer (p&p €0.75)</p>	<p>The Wild Plants of Bere, Dursley, Whiddy and other Islands in Bantry Bay ISBN: 978-1-870492-48-5 SB 170 x 245 mm (240 pp) €19.99 (plus p&p €3.00)</p> <p>Ireland's Hidden Depths ISBN: 978-1-870492-53-9. SB 277 x 227 mm (160 pp). Special Offer: €10.00 (was €17.99) (plus p&p €3.00)</p> <p>Sherkin Comment ISSN: 0791-2447 Subscription €8.00 (4 issues per sub – p&p included)</p>
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Books can be ordered through Paypal or by cheque or postal order from the Station's website www.sherkinmarine.ie

or contact us at Sherkin Island Marine Station, Sherkin Island, Co Cork.
Tel: 028-20187 Email: sherkinmarine@eircom.net



GAISCE – the President's Award

Young People Rise to the Gaisce Challenge

YOUNG people from across Munster were celebrating earlier this month at Gaisce's recent Silver Awards ceremony, which took place on November 19th in Limerick's Radisson Blu Hotel.

The young Awardees, drawn from schools and youth organisations across Munster, achieved the Gaisce Silver Award in recognition of their completion of over 26 weeks of personal, physical and community challenges.

Gaisce is not a competition, but rather a self-development programme – an opportunity for young people to set their own challenges, and work to achieve them. Gaisce is a direct challenge from the President of Ireland to young people aged 15–25 to dream

big and realise their potential.

The Gaisce programme is delivered by over 1,500 PALs working and volunteering in a variety of organisations across Ireland. There are three levels of Gaisce – Bronze, Silver and Gold. The more time and energy participants give, the greater their reward.

At the Munster Silver Awards ceremony, over 100 young people from across Munster were presented with Gaisce Silver Awards. The ceremony was hosted by RTE 2FM star Will Leahy, with Ireland and Munster rugby legend Jerry Flannery in attendance as Guest of Honour. Jerry presented the Awards to the young people on behalf of Gaisce's Patron the President of Ireland, Michael D. Higgins.

Jerry gave an inspiring speech to the young Awardees – encouraging them to continue to set their own goals. Speaking at the ceremony, Jerry Flannery said, "What you have learned through Gaisce can apply to everything in life – keep setting yourself challenges and working hard to achieve them. I'd encourage you all to continue with your Gaisce journey and drive for the Gold Award."

Speaking at the event, Gaisce's CEO Yvonne McKenna said "Congratulations to all of Munster's newest Gaisce Awardees. Completing the Gaisce Award is a huge achievement. The Awardees at our Munster Ceremony collectively contributed over 2,600 voluntary hours to their com-



Award recipients from Christ King Girls' Secondary School, Cork, with Jerry Flannery and Gaisce's CEO Yvonne McKenna.

munity and travelled over 5,000 kilometres on their Gaisce journey."

Yvonne continued "A huge thanks to our incredible network of President's Award Leaders for supporting and encouraging Gaisce participants to dream big and realise their potential."

Yvonne encourages any young people not currently taking part in Gaisce to visit www.gaisce.ie to get involved. Yvonne continued, "Gaisce is a great way of making new friends, growing your confidence and developing new skills and hobbies. Gaisce can also help when it comes to looking for a job – it is nationally and internationally recognised as sign of motivation and hard work. Gaisce shows employers and others that you have the ability to set your own goals and can work consistently to achieve those aims. Above all else, Gaisce is fun! We think if you give it a try, you won't regret it."

Over 20,000 young people take part in Gaisce each year. This year marks a big milestone for Gaisce – The President's Award as the organisation marks its 30th anniversary. Since 1985 over 300,000 people have participated in Gaisce.

What Gaisce Awardees said:

"I gained so much more from it than I put in, and would recommend the award to anyone" – Tommy Monahan, 2015 Awardee

"The trip taught me to be more open and it reminded me that time is an important



Award recipients from Midleton College, Midleton, Co Cork.



Award recipients from Scoil Mhuire, Wellington Road, Cork.

resource that everyone may share with others if they wish" – Julie Patterson, 2015 Awardee

"Gaisce has been crucial in pushing me towards the areas that I plan on focusing my career in the future" – Avril Buttle, 2015 Awardee

For more information on Gaisce – The President's Award or to rise to the Gaisce challenge, visit www.gaisce.ie



Jerry Flannery addresses the Gaisce Awards Ceremony.

Cara Partners wish continued success to Matt and his team at Sherkin Island Marine Station

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ReCreate is a national social enterprise that takes end-of-line and surplus stock from businesses and reuses them as arts materials. Their warehouse is full to the brim with all types of fantastic arts materials such as paper, wool, plastics, fabric, tubing, foam and many other unusual and unexpected surprises.

Located at Ballymount Drive, Dublin, just off the Long Mile Road and the M50, ReCreate is not only helping businesses reduce their waste but is also helping schools and communities to stretch their budgets and their imagination.

ReCreate is a not-for-profit membership organisation, which anyone can join. Membership gives unlimited access to their 'warehouse of wonders'. For an indication of the range of materials available, check out their website www.recreate.ie and Facebook site, which are updated regularly. They operate a membership model so they can demonstrate to businesses that their materials will be used for creative purposes. The enterprise now has over 1000 members. Individuals, early childhood groups, schools, colleges, community and art groups, art students, artists and crafters, active retired groups, clubs and societies are all welcome to become members.

There is a creative workroom in-house if members want to create items on the spot. This room can be hired out for art workshops, community or individual projects, children's parties or corporate outings with a creative twist.

They have a wide range of membership fees and options and they will be happy to help you get ReCreating. The membership rates vary depending on the type and size of your organisation or project. For the annual fee you will be able to visit the warehouse of materials and supplies as often as you wish during the year. A membership form is available online at www.recreate.ie. They offer best value and a range of materials you won't find anywhere else in Ireland.

ReCreate would be delighted to hear from businesses who have surplus materials. There are free collections in keeping with the needs of your company. Large quantities are accepted if suitable - up to a van load at a time. These donations make a positive impact on the environment.

To contact ReCreate:

Unit 8, Block K, Ballymount Drive,
Ballymount Industrial Estate,
Dublin 12. Office: 01 456 8798
Email: info@recreate.ie
www.recreate.ie

Images courtesy of www.recreate.ie



ReCreate's warehouse, located in Ballymount (Dublin 12), where you can find all types of fantastic art materials.



Left: Mother's Day flowers. Right: A dress made from ReCreate's materials.



High Demand Materials

ReCreate need a wide range of clean, safe, versatile business waste materials - production offcuts and by-products, rejected QC batches, bankrupt and redundant retail stock, and unused raw materials, and packaging materials.

- ⇒ Card & paper - all types
- ⇒ Fabric & textiles - rolls, large pieces - any type
- ⇒ Netting
- ⇒ Containers with lids - boxes, pots, & bottles
- ⇒ Plastic & rubber tubing
- ⇒ Plastics - sheet Perspex, acetate, Corex etc.
- ⇒ Foam rubber
- ⇒ Tubes - card, plastic etc.
- ⇒ DIY materials
- ⇒ Wood & timber -interior/planed
- ⇒ Rope, cord & twine
- ⇒ Catering disposables (unused)
- ⇒ Foils & films
- ⇒ Plastic granules
- ⇒ CDs & CDRs
- ⇒ Stationery - all sorts
- ⇒ Novelty goods
- ⇒ Packaging materials - unused
- ⇒ Anything unusual



Eli Lilly S.A. – Irish Branch Pharmaceutical Manufacturers



Eli Lilly wishes "Sherkin Comment" continued success.

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The Pollution Story Continues

By Mike Ludwig

APPARENTLY we have not learned from our prior misunderstandings about the consequences of dumping wastes into uncontained settings. For instance, plastics are a pretty unique waste in that they create multiple types of adverse impacts. This is related to the fact that they occur in many forms and they tend to create a wide variety of problems in the environment. And, they can accumulate significant amounts of biologically harmful chemicals such as dichlorodiphenyltrichloroethane (DDT) and polychlorinated biphenyls (PCBs) from seawater increasing their range of potential impacts. Those chemical accumulations can reach concentrations orders of magnitude above background levels. When eaten, the captured pollutants can be released into the organism. This has been shown in Laboratory studies of marine worms, fish and marine mammals. The extent of the transfer depends on the plastic polymer, contaminant, and conditions within the organism, particularly pH and temperature. The interactions appear organism specific and are not yet fully understood. But, the investigations have discovered that the newest pollution problems come from the newest cosmetics, clothing, and cleaning techniques, namely; microplastics.

Society is aware of the problems created by large plastic debris released into the environment creating entanglement, ingestion, suffocation, and often leading to animal stranding and even death. In contrast, microplastics are not as obvious a threat as they are plastic bits



Microplastics are so small that normal waste processing systems are incapable of capturing or removing them from discharge streams.

less than five millimeters (5 mm) in size. Unfortunately, particles of this size are available to a much broader range of species and therefore can cause a wider swath of threats to their wellbeing.

There are two types of microplastics: primary microplastics which are manufactured as human use materials and products, and secondary microplastics which are microscopic plastic fragments resulting from the deterioration of larger plastic items. Microplastics come from a variety of sources, including cosmetics, clothing, and byproducts of industrial processes creating larger items. The other source is degradation such as with Styrofoam cups and fast food containers are classic sources this and technology advances provide the new particles. Unfortunately, both types of microplastics are persistent. This is particularly problematic in aquatic and marine environments. Because plastics decompose so slowly, they are available and can be ingested and even incorporated into the organs and tissues of living organisms multiple times. The entire cycle and movement of microplastics in the environment is not yet fully known or appreciated, but research is revealing ever more about their presence.

The smaller than 5 mm beads or pieces of plastic are used to improve facial scrub efficiencies, toothpaste cleaning abilities and synthetic fabrics. Unfortunately the particles are so small that normal waste processing systems are incapable of capturing or removing them from discharge streams. Adding the necessary screening would clog those processing systems. As a result, the tiny particles of plastic are finding their way into the environment in ever larger numbers. The particles can have a buoyance characteristic that allows them to remain in the water column for extended periods of time. Because they are present in the water column and so small, some are being seen by plankton feeders as food items or incidentally eaten along with real plankton items. This consumption is allowing the particles to move upward in food webs and appearing in larger organisms. The problem has become so pervasive that we are seeing some of the smaller particles embedded in the edible portions of the seafood we eat. Because human digestion isn't that different from the things we eat, humans are likely to be accumulating these plastics in our bodies as well.

The presence of microplastics in the environment is often recorded as a by-product of aquatic studies. These studies include plankton, sandy, and muddy sediments sampling, along with vertebrate and invertebrate characterizations, associated dietary analysis, and chemical pollutant interactions. They have revealed that there can be up to a million pieces of floating microplastics per square kilometre in a subtropical ocean gyre. Similarly, microplastics appear to be common in sea ice. Arctic Sea ice inspections have identified it as a reservoir for microplastic particles. Curiously, the bits support some unique species.

Given the concerns over microplastics, the desire may be to harvest them, but substantial removal of microplastic debris from the environment is not feasible. Identification and elimination of the major inputs of plastic waste is a more promising route, as is reduced consumption and the recognition that plastic waste could be a resource. With our increasing human population and the need for greater resource management, the benefits of reducing debris entering the environment have profound results.

In recent months, major cosmetics companies including Johnson & Johnson, Unilever, and Procter & Gamble have pledged to phase out microplastic beads in favour of natural materials but the changeover is likely to take more than two years to complete. A Styrofoam cup exist for over 400 years. That is a lot longer than most of us will live!

Mike Ludwig, COWI/OCC 35 Corporate Drive, Trumbull, CT 06611, USA.

Five new stamps salute the human senses...

This set of colourful stamps is striking and original and represents each of the five senses. The stamps feature enhanced production techniques: **Taste** – strawberry flavoured gum, **Touch** – thermochromic ink, **Sight** – transparent paper, **Hearing** – thermographic ink and **Smell** – mint fragrance.

In addition, all of the stamps contain image recognition technology to allow users with Smartphones with the CEE app installed, to link to specially compiled online material related to the five senses.

Order these exciting stamps now at www.irishstamps.ie or by calling +353 (1) 7057400.