

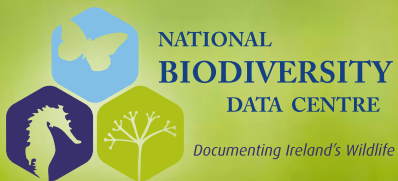
Biodiversity

IRELAND

Bulletin of the National Biodiversity Data Centre
Issue 6 – Autumn 2010



a Creating **BUZZ** in International Year of Biodiversity



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Editorial

While putting together each issue of Biodiversity Ireland, it strikes me how many people are actively involved in biodiversity conservation in Ireland and what fantastic work we are doing. In this issue, we have our Biodiversity Tales with updates on Irish bees, beetles, birds, marine invertebrates, vascular plants, whales and dolphins and Irish phenology. Alison Donnelly tells us of the work on Irish phenology and how Irish plants and animals are responding to climate change, while Roger Goodwillie reviews two recent county floras. In the Biodiversity Research section, Olaf Schmidt, Aidan Keith, and Louise Scally give an overview of two large research projects. But our biodiversity work does not just happen within Ireland, many Irish organisations and researchers are involved at an international level. NOBANIS is an excellent example of how co-operation at a European level can be extremely important for the conservation of our biodiversity and the Data Centre is very proud of our involvement.

It can be difficult to find the time to record species and contribute to recording Ireland's biodiversity. To help us Úna Fitzpatrick has written an article for this issue on identifying Irish bumblebees and persuades us that with the right key in our hand it is straight forward. With the right direction, we can all make a contribution towards recording our biodiversity.

We're coming towards end of International Year of Biodiversity and what a year it was! Here at the Data Centre we had a packed programme of events including a series of workshops on identifying and monitoring Ireland's biodiversity, Biodiversity Bingo, the BioBlitz 2010 in May, and our 4th Annual Recorder's Event in August. We now have the opportunity to pull together the information that came out of these events and use it to better inform the conservation of our biodiversity and indeed halt its loss. The International Year of Biodiversity invites us to take action in 2010 and beyond. This is not only a challenge for the National Biodiversity Data Centre, policy makers or politicians but for each and every one of us. A challenge to make our own contribution to halting the loss of biodiversity.

Eugenie Regan

Eugenie Regan - Editor



Director's Comment



It is too early to say if International Year of Biodiversity 2010 will have a lasting legacy for the conservation of biological diversity in Ireland.

What is clear, however, is that there have been developments during the year which could potentially become significant drivers of change in the years ahead.

Of primary importance was the release for consultation by the Department of the Environment, Heritage & Local Government of the 2nd National Biodiversity Plan. The first National Biodiversity Plan was produced at a time when public finances were healthy and it provided a stimulus for delivery of many positive actions. The 2nd National Biodiversity Plan will be finalised in an entirely different context and the challenge faced is to come up with a national strategy which delivers benefits for biodiversity. However, this should be done through increased efficiencies in service delivery and increased cooperation between partners. Properly framed, this could become a strategy for all organisations to rally behind and affect significant change in the realm of public policy.

Comhar, the Sustainable Development Council, has taken the initiative to examine how the Economics of Ecosystem Services (TEEB) work emerging at the European level could be applied in Ireland. This initiative draws attention to the economic benefits of biodiversity and to the growing costs associated with biodiversity loss and ecosystem degradation. What is exciting about this approach is that it brings together expertise from fields of science, economics and policy to identify practical measures for positive actions. And, not least, it has potential to bring fresh thinking to solving problems that have been with us for many decades.

One practical demonstration of how this might be done is the *Creating Green Infrastructure for Ireland* report, also produced by Comhar. This explores ways in which the principles of Green Infrastructure, defined as 'an interconnected network of green space that conserves natural ecosystem values and functions and provides associated benefits to human populations' can be integrated into spatial planning.

It builds on the pioneering work of Fingal County Council in promoting the integration of Green Infrastructure with traditional planning and demonstrates in a practical way how the goods and services provided by biodiversity can deliver real benefits for society at the local level.

Mention of International Year of Biodiversity cannot be complete without reflecting upon the first global biodiversity target, namely 'to halt biodiversity loss by 2010.' Clearly the target was never going to be achieved but it did provide an important political commitment to be used to press for action. My opinion is that conservation professionals did not make the most of this opportunity to raise the importance of biodiversity conservation at the political level. We now need to look ahead to 2020 and the new European biodiversity target and work to make this a more meaningful milestone.

To this end, the Data Centre has produced a knowledge gaps framework entitled *2020 Vision - improving Ireland's biodiversity knowledge base*. This document is one of the outputs from a Biodiversity Knowledge Quest event held by the Data Centre in Waterford in August 2010. With the input of national experts, it identifies the key gaps that could be filled over the coming decade to significantly improve our knowledge of Ireland's biodiversity and to have systems in place that would adequately track changes. We hope that its production will provide a road map for a greatly improved state of knowledge on Ireland's biodiversity as one of the Centre's contributions to the 2020 biodiversity target.

We now need to look ahead to 2020 and the new European biodiversity target and work to make this a more meaningful milestone.

Liam Lysaght - Centre Director



Creating a buzz in International Year of Biodiversity – BioBlitz 2010



The winning team at Connemara National Park (Colette O'Flynn)

A biodiversity race against time was held over 24 hours on the 21st-22nd of May at six wildlife sites across the country. This was a race against time to see which site could record the most species. The sites that took part were: Fota Wildlife Park, Co. Cork; Glenveagh National Park, Co. Donegal; Connemara National Park, Co. Galway; Coole Park, Co. Galway; Newbridge Demesne, Co. Dublin and Wicklow Mountains National Park. This unique event was organised by the National Biodiversity Data Centre to celebrate the International Year of Biodiversity.

Over 130 scientists were involved in the day and thousands of species were recorded. Of course each site had their specialities with Coole Park recording record numbers of invertebrates, Connemara National Park focusing on bryophytes, and Wicklow National Park had their own diatom expert. Newbridge Demesne was not expected to record as many species as some of the other sites because of the lack of habitats of conservation importance, but amazingly 86 fungi species were recorded from the site by Kieran Connolly, Howard Fox, and Maria Cullen, including a species new to Ireland. Just shows what's out there when we look!



BioBlitz

There was hectic recording activity over the last hour. Despite the late burst of activity from Coole Park, the winners were Connemara National Park. The total of 542 species recorded at Connemara National Park over the 24-hour period - an amazing tally. The Connemara National Park team are therefore crowned BioBlitz 2010 Champions!

Thank you to all who participated including those not listed.





Connemara National Park:

Pat Aylward; Elizabeth Birdthistle; Ken Bond; Dermot Bree; Caitriona Carlin; Helen Carty; Sinead Conroy; Caitriona Cunningham; Christine Eschmann; Brendan Flaherty; Cian Flaherty; Margaret Flaherty; Gadaloff family; Marie Louise Heffernan; Rory Hodde; Padraig Keirns; Caitriona Maher; Claire Moore; Ger O'Donnell; Colette O'Flynn; Angus O'Donnell; Sarah O'Malley; Chris Peppiatt; Carole Reynolds; Mary Ruddy; Myles Ruddy and Bryony Williams.

Coole Park:

Roy Anderson; Robert Angus; Frank Bamuel; Penny Bartlett; Sinéad Biggane; Mike Bryan; John Conaghan; Gordon D'Arcy; Mike Fitzsimmons; Julie Fossitt; Janice Fuller; Jervis Good; Peter Hodge; Frances Lucy; Kate McAney; Hilda MacLochlainn; Stephen McCormack; Donal McDonnell; James Moran; Ger Morgan; Brian Nelson; Tara Ní Fhloinn; Áine O'Connor; Áine O'Loughlin; Ellen O'Sullivan; Margaret Parry; Pyotr Petrov; Eugenie Regan; Ignacio Ribera; Matt Smith; Raymond Stevens; Chris Williams and Mike Wyse Jackson.

Fota Wildlife Park:

Meabh Boylan; Abi Brewer; Padraic Casey; Rhena Casey; Kieran Cronin; Chris Cullen; Sara Curtis; Cian Gill; Jo Goodyear; Lynda McSweeney; Catriona Mc Cabe; Orla Mc Laughlin; Mark Nolan; Lisa O Grady; Lorna O Mahony; Aisling O Malley; Caroline Patrick; Rosalyn Thompson; Barry Walsh; Andrew Walsh; Paul Whelan and Mark Wilson.

Glenveagh National Park:

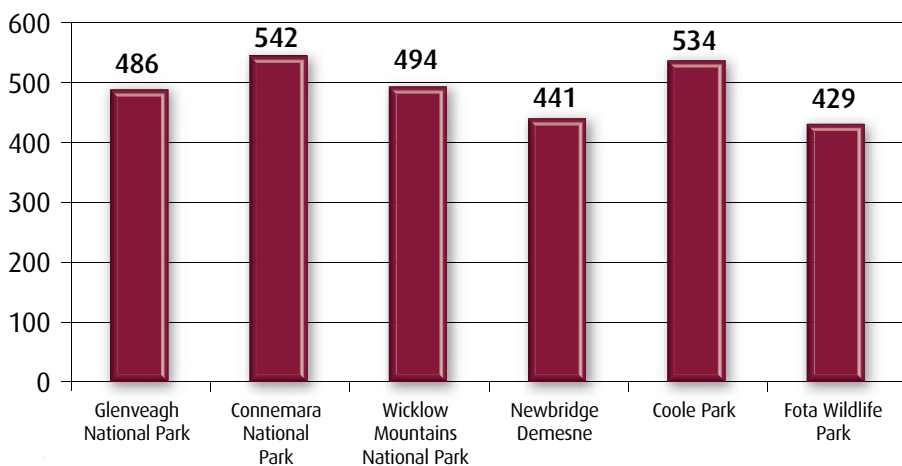
Bob Aldwell & the Donegal Butterfly Recorders' Network; Mary Brennan; Clare Bromley; Amy Burns; John Cromie; Stuart Dunlop; Ian Fellows; Aengus Kennedy; Úna Fitzpatrick; Carol O'Callaghan; Northern Ireland Fungus Group; North Western Regional Fisheries Board; Fionnuala O'Neill; Ralph Sheppard; Liz Sheppard and Melinda Swann.

Newbridge Demesne:

Bat Conservation Ireland; Diarmuid Browne; Brenda Comerford; Colm Clarke; Kieran Connolly; Shay Connolly; Maria Cullen; Fingal Branch BirdWatch Ireland; Liam Feeney; Colum Fitzgerald; Stefanie Fleischer; Howard Fox; Brian Keeley; Ian Killeen; Liam Langan; John Lovatt; Darach Lupton; Shawn McCourt; Evelyn Moorkens; Eamonn O'Donnell; Julie Roe; Colm Ronayne; Yosh Sakiyama; Olaf Schmidt; Alan Sullivan; Hans Visser and Lynda Weekes.

Wicklow National Park:

Letizia Cocchiglia; Maria Cullen; Ian Edwards; Katy Egan; Ciara Flynn; Howard Fox; Wendy Gillissen; Mary Kelly-Quinn; David Lawton; Liam Lysaght; Hugh McLindon; Sean Meehan; Méabh Ní Chuinneagáin; Anne Marie O'Shaughnessy; Gillian Stewart; Eleanor Sutherland; Angus Tyner; Maria Walsh; Faith Wilson and Leszek Wolnik.



And the winners are...Final tally from all six sites showing a close finish between Connemara National Park and Coole Park.



Examining mini-beasts at Newbridge (Lynda Weekes)



Ralph Sheppard ticking off yet more species at Glenveagh National Park (Úna Fitzpatrick)

Timing is Everything

Alison Donnelly from TCD explains the term 'phenology' and why it is important for climate change research

Each spring, buds begin to come alive on trees, flowers start emerging from the cold ground and many migratory birds commence their long journey from sub-Saharan Africa to arrive in our gardens – all of these events mark the end of winter and the beginning of a new spring season. When spring temperature is warmer than usual we notice leaves emerging early, snowdrops bursting out of the ground early and of course the swallow arriving early too. On the other hand, when spring temperature is colder than usual, as was the case this past spring, all of these events were slightly delayed and we considered it a 'late' spring. The study of the timing of these recurring life-cycle events in plants and animals is called phenology and the events themselves are called phenological phases or phenophases for short.

unfolding, flowering, leaf colour and leaf fall, has been recorded since the early 1960s and continues to be recorded today. Figure 1 shows the day of the year when leaf unfolding occurred for two cultivars of *Fagus sylvatica* (beech) cultivars from 1970 to 2008. A lot of year-to-year variation can be seen in the data but the overall trend was for leaf unfolding to be occurring nearly three weeks earlier in 2008 than in the 1970s. This trend has, at least in part, been attributed to rising spring temperature.

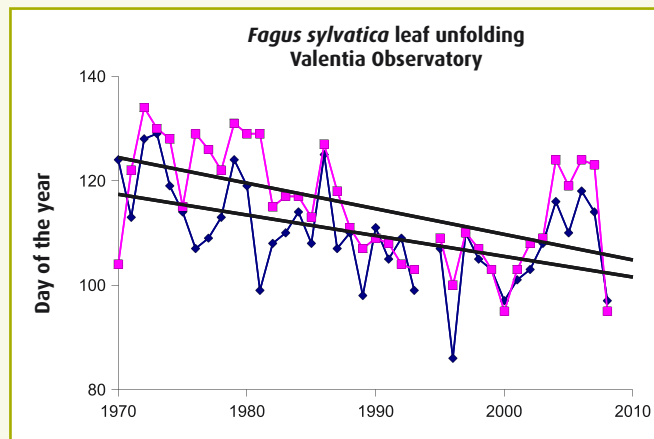


Figure 1. Timing of leaf unfolding from 1970 to 2009 for two cultivars of beech growing at Valentia Observatory, Co. Kerry.



Various phenological phases of budburst and leaf unfolding of *Populus tremula* (Image: Annelies Pletsers).

If we have annual records of the date when budburst of a particular tree occurred over its lifetime we can infer if spring temperature was warmer or colder than usual. Budburst would be early if the temperature was warm or late if the temperature was cold. Similarly, if we know the date of arrival of migratory birds we can infer what spring temperature was like. This sensitivity to temperature makes phenology a useful indicator of temperature and is therefore an important tool in climate change research. Indeed, a study of over 100,000 primarily spring phenological records from 20 European countries – one of which was Ireland, was used to convince global policy makers that climate change was having a direct impact on our immediate environment.

Tree phenology

In Ireland we have historic records of tree phenophases at four sites (Valentia Observatory, Co. Kerry, the National Botanic Gardens, Dublin, and Johnstown Castle and JFK Arboretum both in Co. Wexford), which form part of the pan-European International Phenological Gardens network. This network was established by the German weather service in the late 1950s whereby clones of a suite of trees were distributed to 50 sites across Europe with a view to determining the impact of local climate on life-cycle events in trees. A range of phenophases such as, budburst, leaf

Bird phenology

We have analysed data from a range of spring migrant birds to determine if they are arriving to Ireland earlier over a 30-year period. All the birds we studied were arriving from sub-Saharan Africa and only two out of the 11 birds examined showed a tendency to arrive later, which meant that the majority of the birds were arriving earlier at the end of the time series than at the beginning. This trend has, at least in part, been attributed to rising spring temperature. The table below shows the list of birds examined and whether they were occurring earlier or later over the 1969-1999 time period.

Common cuckoo	Later
Common swift	Earlier
Sand martin	Earlier
Barn swallow	Earlier
Common house martin	Earlier
Whinchat	Earlier
Northern wheater	Earlier
Common grasshopper warbler	Earlier
Sedge warbler	Later
Common whitethroat	Earlier
Willow warbler	Earlier

Insect phenology

Another important group are also showing a response to spring temperature – the insects. Analysis of a suite of moth species has shown that appearance dates and flight periods are correlated with spring temperature. When spring temperature is high appearance dates are earlier and flight periods are longer.

What does the future hold and what are the consequences of an earlier spring?

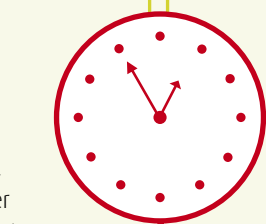
As regards budburst we can make projections into the future using sophisticated computer models and we can see that the trend for budburst to become earlier in spring will continue at least until the end of the current century driven by an increase in spring temperatures. The potential consequences of this are (a) an increase in timber production as the leaves will be on the tree for longer and photosynthesising for a longer period producing more biomass, (b) more carbon dioxide will be removed from the atmosphere – again due to the leaves emerging earlier and therefore living longer and (c) an earlier start to the pollen season. In addition, many temperate trees require cold winter temperatures for budburst to occur but if winter temperatures rise this ‘chilling’ may not be fulfilled and young leaves emerging earlier are susceptible to late frost damage and this could cause economic losses for some species of fruit trees. So all in all there are gains and losses related to earlier leaf unfolding.

As yet there are no computer models available to project what might happen to Irish birds and insects in future but based on past data we can expect the earlier arrival and appearance dates in spring to continue at least into the near future.

Life is never that simple...

So far we have concentrated our efforts on examining the response to rising temperature of individual groups of plants, animals and insects. However, life is never that simple and we now need to concentrate our efforts on examining ecosystems as a whole. Plants and animals continuously interact and are dependent on one another for survival. For example, caterpillars feed on newly emerging leaves and subsequently birds feed on the caterpillars. So in order for an ecosystem to survive, the timing of these interdependent phenophases must remain synchronised.

Recent studies have shown that leaf emergence of oak and caterpillar emergence are both responding to rising spring temperature at the same rate and therefore remaining in sync. The migrant bird that feeds on the caterpillar is also arriving earlier but its arrival time is not quite as early as it should be to benefit from the peak in abundance of its caterpillar food source. This results in a reduction in the number of migrant bird chicks the food source can sustain and a consequent decrease in population size. This could result in a possible increase in resident bird population size who were there to profit from the peak timing of the caterpillar food source. Therefore, this mismatch in phenology between a predator and its food source due to differing abilities to respond to rising temperature can have implications for the ecosystem as a whole. In addition, there is every reason to believe that these mismatches in interdependent phenophases (such as, the plankton-fish-bird chain) will become more evident in future, with resulting changes in biodiversity, as temperature continues to rise.



An earlier spring could mean an earlier start to the pollen season (Shutterstock).

A mismatch in phenophases due to climate change could impact bird species like the swallow (Shutterstock).

Prevention is easier than the cure

Helene Nyegaard Hvid explains how a Pan-European network is fighting invasive species in Europe

Invasive plant and animals are one of the greatest threats against biological diversity, second only to the effects of habitat destruction and fragmentation.

Prevention is indeed easier and much cheaper than cure. The successful invasion by alien species is almost irreversible, because most invasive alien species have succeeded in spreading in large numbers before they have been observed. And it becomes almost impossible and certainly very costly to eliminate them. However, species know of no borders and this makes international collaboration essential.

NOBANIS

The North European and Baltic Network on Invasive Alien Species (NOBANIS) was established as a network between authorities of the region. One of the main goals is to provide tools for implementing the precautionary approach against the unintentional dispersal of invasive alien species. It also establishes regional cooperation to aid countries in eradication, control and mitigation of these species.

The establishment of NOBANIS was a response to the recommendations that came out of the Convention on Biological Diversity's 6th meeting of the Conference of Parties in 2002. At that meeting, invasive alien species were made a priority and it was recognised that collaboration on this problem needed to be at both national and international levels.

The NOBANIS network has a national focal point in each of the participating countries - Austria, Belgium, Czech Republic, Denmark, Estonia, Faroe Islands, Finland, Germany, Greenland, Iceland, Ireland, Latvia, Lithuania, the Netherlands, Norway, Poland,

Slovakia, Svalbard and Jan Mayen, Sweden and the European part of Russia. The network has grown over time, and more countries are expected to join in the future.

Easy access to information

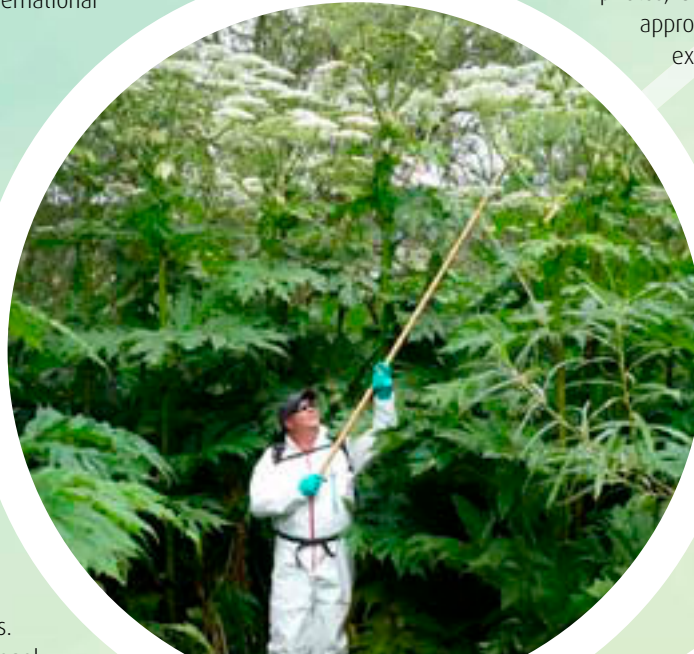
We have developed a portal with access to information about the alien and invasive species of the region. This includes a central database with updated information from all the NOBANIS countries, factsheets of the most invasive species in the region, access to an identification key to marine invasive species, newsletters, a species alert function for new invasive species to the region, an invasive species photo bank, and information about the national legislation on invasive alien species in the region.

The database of alien species in NOBANIS will be used to identify species that are invasive at present and species that may in the future become invasive. The database also provides information on how the species is introduced, its distribution in the region, what habitats it may inhabit, what ecological and socio-economical effects it may have and references to relevant literature.

The fact sheets are written by experts of the NOBANIS region and refereed by all participating countries to reflect the collated knowledge and experience of all managers and scientists. They include information about species description and photos, distribution, ecology, impacts, management approaches, references, and contacts to local experts.

Why all the fuss?

Many alien plant and animal species are deliberately introduced because they are beneficial to humans, i.e. crop or farm species used to sustain the world's growing human population. However, some become invasive and have negative effects on human health, economy or biodiversity.



Giant hogweed is a massive problem in most European countries and difficult to eradicate as each plant can produce 50,000 seeds! (Tom Richards, Wye and Usk Foundation).



The yellow-bellied slider, *Trachemys scripta*, is a New World species that has spread throughout the Old World due to a demand for pet turtles. They are introduced to the wild (mainly urban parks) when released by their owners. The effects on natural habitats and ecosystems is unknown. (Shutterstock).



Rosa rugosa is a common garden plant in Ireland but has detrimental impacts on sand dune habitats in many countries, including Norway, Finland, and Denmark (Helene Nyegaard Hvid)

Invasive species may harm the world's ecosystems by:

- **Altering the local food web - e.g. making food sources for native species scarce**
- **Predating on native species – thereby reducing or eradicating native species**
- **Out-competing native organisms**
- **Being toxic**
- **Being a reservoir for new parasites or a vector for pathogens**
- **Hybridising with a related native species.**

These effects may result in substantial decreases in or even cause extinction of the populations of native species.

A good example is the giant hogweed, *Heracleum mantegazzianum*, which originate from the Caucasus region between the Black Sea and the Caspian Sea, but was introduced in Europe in the 19th century as an ornamental plant. It thrived and after 50-100 years it started to spread uncontrollably. Today it is a massive problem in most European countries in meadows, forests, recreative areas and other open areas, and since is a very hardy plant, producing 50,000 seeds each, it is impossible to eradicate. The problems are caused by the giant hogweeds extensive growth in early spring where it forms dominant stands, leaving large areas over shaded. In this shade, no native plants, birds or butterflies can live – only few insects and snails can survive. It is thus out-competing all native vegetation in the invaded areas. Furthermore, the giant hogweed withers away completely during winter, leaving the ground barren, which increases the risk of erosion and destruction of river banks.

Adopting a precautionary approach

Since introduction of new species has proven to have many negative effects in most parts of the world, it is important to adopt a precautionary approach to future intentional introductions, i.e. not to allow introductions of an alien species if there is a risk that the species will cause harm to the environment, human health or the economy.

For further information on NOBANIS, please see www.nobanis.org or email the secretariat at nobanis@sns.dk

NOBANIS and the National Biodiversity Data Centre

Colette O' Flynn, research officer with the Data Centre, is one of the national contact points for NOBANIS in Ireland. When dealing with invasive species in a globalised world, keeping up-to-date on what potentially invasive species are arriving into Europe is of paramount importance. Being part of the NOBANIS network provides a mechanism for surveillance, information exchange, and collaboration on projects at the European level. Regular duties include input into species factsheets and feeding data into the NOBANIS database for all of Ireland.

Supporting the work of the European Commission is also vital and Ireland along with the other 20 NOBANIS countries provide informed and coordinated support through this platform. In June, the Data Centre hosted a European workshop attended by 24 delegates from 16 countries on developing a European-wide early warning system. Work on developing and pilot testing an overall information system for Europe is ongoing and includes developing invasion risk maps for Europe.



Professor Kieran R. Byrne, President of Waterford Institute of Technology addresses the delegates at the NOBANIS European Workshop

Lupinus polyphyllus is native to North America and is another popular garden plant in Ireland. However, this species outcompetes native plants in Lithuania, Norway, Germany, Poland, and Sweden. (Shutterstock).





Bee on flower of Japanese knotweed. BioChange research found that invasive species such as Japanese knotweed result in reduced biodiversity (Shutterstock)

BioChange

Louise Scally on the BioChange research project which examined disparate research areas to address the decline of biodiversity

BioChange was an integrative, multi-disciplinary research framework designed to support national and local biodiversity policy in Ireland. Funded by the Environmental Protection Agency from 2006 to 2009, the aims of the project included developing fundamental biodiversity research and capacity building, as well as development of biodiversity indicators and biomonitoring tools. The main findings were:

- **Simulated climate change and the removal of grazing resulted in rapid changes in biodiversity.**
- **Small sites have both intrinsic local value and broader landscape values and should not be undervalued.**
- **Invasive species have wide impacts on biodiversity. For example, zebra mussels were found to alter nutrient cycling and reduce aquatic invertebrate diversity, while Japanese knotweed invasion resulted in reduced plant species richness.**
- **Biodiversity indicators should be carefully selected. BioChange found that plant diversity did not reflect invertebrate diversity in wetland habitats.**
- **Easy-to-access information is fundamental in halting biodiversity loss. BioChange has produced a database of alien plant species in Ireland, taxonomic information online and an interactive key to the vascular plants of Co. Clare and south Connemara.**
- **While these outputs should already have considerable benefits to stakeholders who need this information, upscaling of these outputs to provide coverage of more taxonomic groups, and geographically to provide national coverage is a priority.**
- **It is clear that Ireland needs to designate some natural/semi-natural locations for both on-going monitoring and experimental manipulation: this is the only way in which we are going to obtain reliable information to predict future biodiversity responses to environmental and other land-use change.**

Through this project, the team realised the key importance of addressing the gap between scientists, the public, and policy. Greater efforts are needed to raise public and political awareness of the values of biodiversity, and we recommend close co-operation NOW between economists, biological, environmental and social scientists to translate scientific evidence into policy and legislation to sustain human livelihoods into the future. Further information on this project can be found at www.biochange.ie.

Soils – the last frontier

Olaf Schmidt and Aidan Keith explain why soils are the final frontier in Irish biodiversity research

Soils are among the most biodiverse ecosystems on earth. The diversity of soil organisms is tremendous; 1g of soil can contain between 5,000 and 10,000 species of micro-organisms! Ecosystem services provided by soils (such as nutrient cycling, waste degradation, pest and disease suppression, carbon storage) depend on the activity of these diverse organisms. However, our knowledge of these organisms is extremely limited.

The primary objective of the CréBeo project was to increase scientific knowledge of soil biodiversity in Ireland. Some of the main findings were that soil type had limited effect on biodiversity. Rather it was the soil properties that affected diversity of soil organisms.

The lack of basic knowledge on soil organisms in Ireland was highlighted by the discovery of 13 predatory nematodes as new to Ireland, the



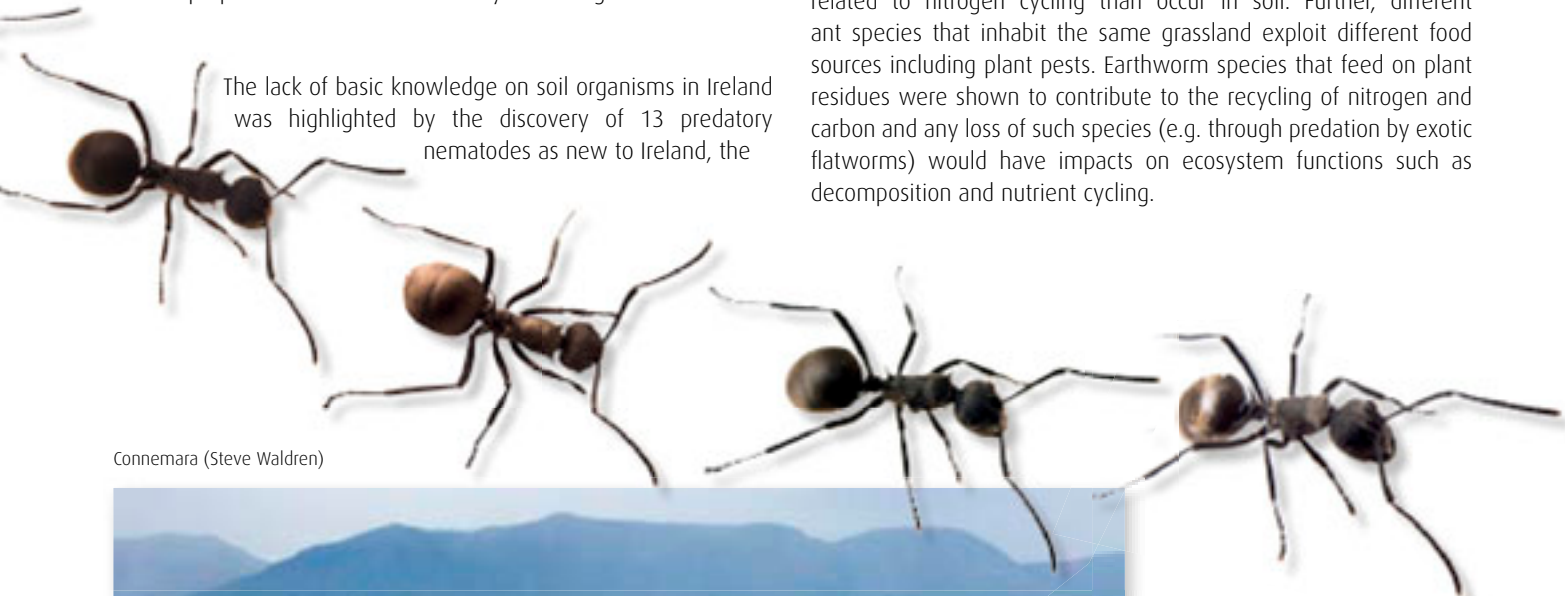
Irish farming is dependent on healthy soils (Olaf Schmidt)



1g of soil can contain between 5,000 and 10,000 species of micro-organisms. Photo of Irish soil arthropods (Aidan Keith).

first record of an earthworm endemic to southern France as well as a mite species potentially new to science.

Interestingly, grassland ants were shown to alter the properties of soil and to harbour different micro-organisms and functional genes related to nitrogen cycling than occur in soil. Further, different ant species that inhabit the same grassland exploit different food sources including plant pests. Earthworm species that feed on plant residues were shown to contribute to the recycling of nitrogen and carbon and any loss of such species (e.g. through predation by exotic flatworms) would have impacts on ecosystem functions such as decomposition and nutrient cycling.



Connemara (Steve Waldren)



The main recommendations of the project were

- 1) to revise the land-use and soil-type classification;
- 2) that the establishment of soil biological monitoring in Ireland is extremely important; and
- 3) a tiered structure of core and specific indicators should be used.

This project was funded by EPA STRIVE and further details can be accessed on the EPA website and at www.ucd.ie/crebeo/

Putting a figure on Ireland's biodiversity

Don Cotton and Eugenie Regan ponder the enormity of our biodiversity

Plants

We also know the number of plants quite well and yet every year a few mosses and liverworts are added to the Irish list. We also have quite a good idea of where those plants can be found within the country. One thing that is surprising is that almost half of our flowering plants (45%) were introduced into the countryside by people over the last few hundred years which begs the question 'do these species enhance Irish biodiversity?' - especially as some of them are problematic invasive species.

Fungi and lichens

We are all familiar with the plants (2,800 species) and the vertebrates (1,000 species) but they account for about 11% of all Irish species. So what are all the rest of the species? Well, would you believe that the fungi and lichens amount to another



Herb robert - *Geranium robertianum* (Liam Lysaght)

If you were asked to guess how many other kinds of creatures do we share Ireland with, what would you say?

A thousand? Ten thousand? A hundred thousand? The truth is that even the scientists studying these things don't know but they are getting a better idea thanks to the hard work of a handful of people and the National Biodiversity Data Centre. The current state of knowledge lists about 25,000 species but we know that this is underestimated. If the soil and marine ecosystems were more fully studied then many thousands more species would be added to our lists.

Vertebrates

What we do know quite well is the number of kinds of vertebrates (mammals, birds, reptiles, amphibians and fish) that occur in Ireland. Some of these animals are migratory (birds, whales, and turtles) and spend a part of their lives in other countries so our part in their life cycle has an international dimension.

2,800 species and the algae are another 1,000 species so together they are about equal to the plants and vertebrates!

Invertebrates

It will be a great surprise to many people to learn that at our current state of knowledge, over two-thirds of all the creatures inhabiting Ireland are creepy crawlies; and that as we discover more about our living heritage this figure is only going to grow bigger! So what are these creepy crawlies and do they matter?

The invertebrates can be split into insects and non-insect invertebrates to make things easier. The insects have a huge diversity of species in Ireland - over 12,000 species but there are also a lot of them in terms of abundance.

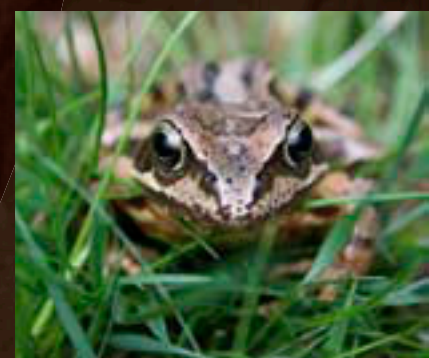
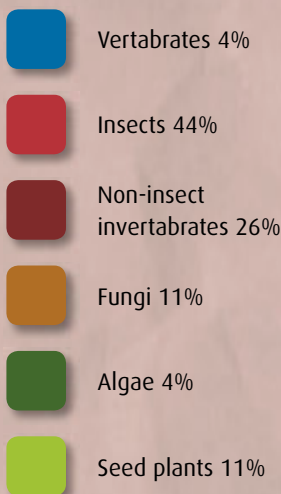
Ponder the fact that there are 6.9 billion of us naked apes on the planet but there are more insects than this in the top 200mm of an Irish farm! They play an essential role in ecosystem functioning, providing many free services including pollination, nutrient recycling, pest control, and a food source for birds, mammals, etc.

The non-insect invertebrates are again crucial in ecosystems. Consider the work done by earthworms in terms of soil health – essential for agriculture. Interestingly, there is more weight of earthworms in the soil of a pasture field than the cattle grazing on top of the ground! But the non-insect invertebrates are an overlooked and understudied group. Many groups of marine invertebrates are poorly documented and our knowledge of these animals is the tip of a very large iceberg.



Pictures from top to bottom: Herring gull (Liam Lysaght), Sea potato (D. Heaphy), Red fox (Shutterstock), Common frog (Jean Dunleavy), Bracket fungus (Jean Dunleavy),

Proportion of species known from Ireland divided into 6 major categories.



Making lists is only the first step...

Whilst great advances are being made by a small number of experts in compiling lists of species, there are still major gaps for many invertebrate groups because no one is studying them. Making lists is only a first step because we then need to know just how common each species is and what its geographical distribution is within the island. This work will go on for a very long time but it will not halt the decline in species diversity and it will not help protect biodiversity. It is therefore essential that we use the data already collected to act as a baseline against which we can monitor change.

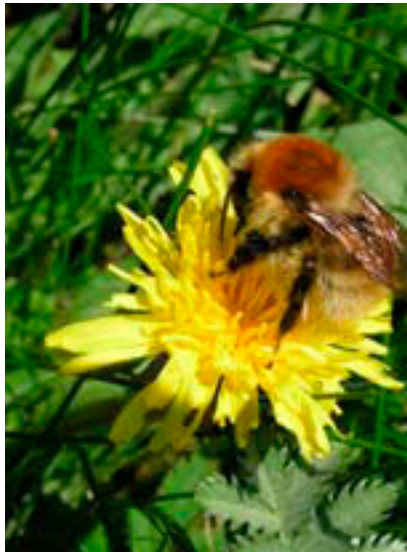
Certain groups of creatures that are representative of a wide range of environments need to be selected in the hope that they will represent the species that have not yet been identified as occurring in Ireland. Then the most important step of all can be taken – and that is to protect the habitats upon which all species depend.

Biodiversity Tales

Bees



Bees - With wild flowers in abundance, it has been a good year for bees. Even the normally rare cuckoo bumblebees have been getting in on the act, with record numbers of sightings of the Gypsy cuckoo bee (*Bombus bohemicus*). *B. bohemicus* doesn't waste time on nest building! Instead it emerges in late spring, finds a White tailed bumblebee nest (*B. lucorum*) and, in an aggressive takeover, outs the *B. lucorum* queen. The insurgent then lays her eggs, and the *B. lucorum* workers raise them for her.



Bombus muscorum (John Breen)

Twenty two people spent the weekend of the 23-25th July surveying the Burren for rare bumblebees as part of a Blitz organised by the Data Centre. Despite poor weather, a total of 12 different bumblebee species were recorded, greatly increasing knowledge of bees in the area. One new population of the Great yellow bumblebee and three new populations of the Shriill carder bee were discovered. Both these species are endangered in Ireland. The Great Yellow Bumblebee, in particular, is very close to extinction; making this new population a very important find. The group also found six new populations of the vulnerable, Red shanked carder bee.

Ireland has 80 species of solitary bees and interesting records have also been appearing of those this year. *Osmia aurulenta* is a coastal species that lives only in empty snail shells. Michael O'Donnell and Janet Whelehan took an excellent photograph of this bee in action at Cahore in Co. Wexford, lining its shell in preparation to lay eggs. Andrew Byrne and I have been recording solitary bees mainly in Co. Waterford and have found new populations of some of the threatened species -

Nomada striata (endangered), *Nomada goodeniana* (endangered), *Andrena nigroaenea* (vulnerable). Andrew has also picked up 12 solitary species from directly around the Data Centre. A lesson in what's out there if you know where to look! Not enough people do, so the plan for 2011 is to try and provide more encouragement and support for new solitary bee recorders and increase our knowledge of these important insects.

Úna Fitzpatrick

Beetles

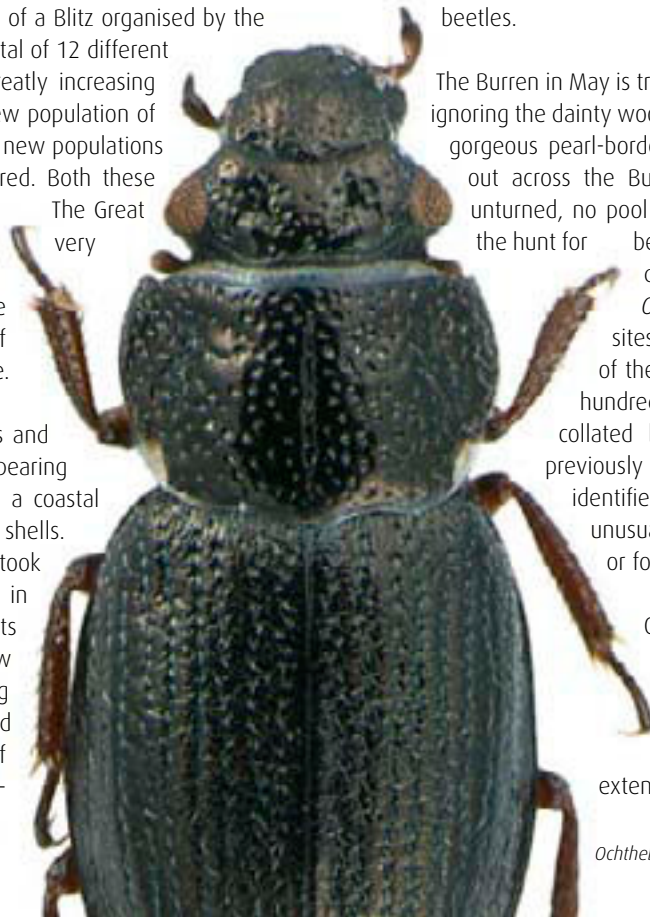


The Second Irish Beetle Meeting - On a hot and sunny weekend in late May this year, beetle experts from across Europe descended on the Burren to partake in the Second Irish Beetle meeting. The general aim of the meeting was to gather as many records of beetles from the Burren as could be managed in a weekend while giving Irish students interested in beetles the chance to meet and learn from some experts. A major attraction for many of the participants was the opportunity to see one of the world's rarest beetles: *Ochthebius nilssoni*. Just 1.5mm in length, this tiny water beetle was discovered in 1986 in a lake in Sweden and until it turned up in the Burren was unknown anywhere else in the world. The meeting also attracted non-water beetle specialists, with diverse interests including: dung beetles, rove beetles, ground beetles, weevils, and leaf beetles.

The Burren in May is truly a magical place to be, so while ignoring the dainty wood whites, dashing brimstones and gorgeous pearl-bordered fritillaries, the group fanned out across the Burren lowlands, leaving no stone unturned, no pool undipped or cowpat unflipped in the hunt for beetles. Some real treasures were discovered, including the elusive *Ochthebius nilssoni* at several new sites, most of which are in the vicinity of the Burren National Park. Records of hundreds of other species are still being collated but already several species not previously recorded in Ireland have been identified and a smattering more rare and unusual species have been rediscovered or found at new sites.

Our visitors from abroad, many of whom have traversed Europe collecting beetles, were greatly impressed by the Burren landscape and the quality and extent of the wetland habitats.

Ochthebius nilssoni (Harald Schillhammer)



The variety of intact and virtually pristine wetlands is not a common phenomenon, certainly in northwest Europe. However, the dry spring and unseasonably warm weather meant some turloughs were almost empty and there was a lot of trudging about in muddy turlough basins in search of some water. Fortunately, the pub in Kilfenora, where the meeting was based, was well stocked with liquids. We are grateful to the Heritage Council for a research grant toward organizing the meeting.

Stephen McCormack

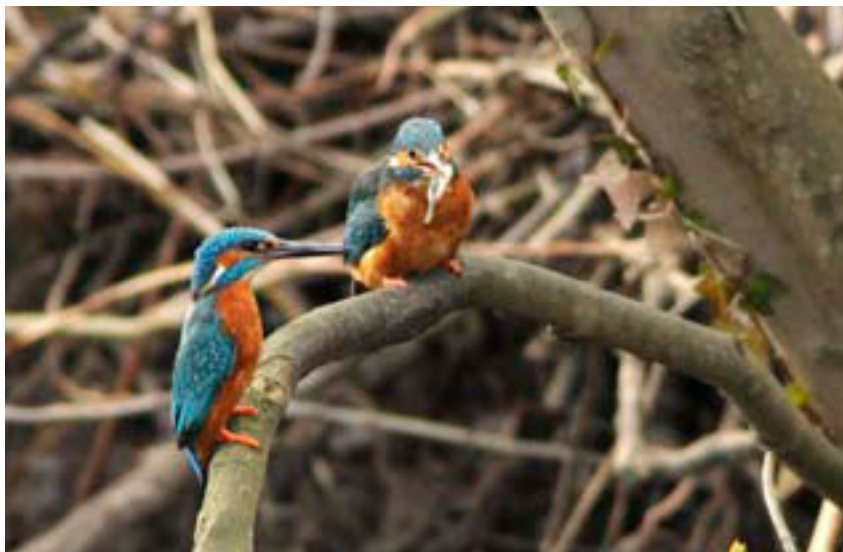
Birds



The severe winter hits our smallest birds - Following the most severe winter for 40 years, the distribution and density data collected on our breeding birds by on-going national surveys will prove fascinating (especially CBS & Bird Atlas). Although the datasets are still being returned and inputted, many observers have given us their 'subjective impressions'. Clearly, any negative impacts are likely to affect our smaller, resident species, rather than the migrants. Some of the former appear to have been hard hit, notably the stonechat which had been increasing in range and numbers over the last decade. Goldcrests and long-tailed tits also seemed rather thin on the ground this summer though wrens and tits survived well. However, the short spring possibly had knock on effects and several nest-box ringers have remarked on small great tit and blue tit brood sizes. Amongst migrants, it has been a good summer for cuckoos, and whitethroats, blackcaps and spotted flycatchers all widely reported.

Kingfishers

This season marked the final year of the Kingfisher Survey funded by NPWS and OPW. The rivers Blackwater, Boyne, Clare, Moy, Barrow and Nore and some of their tributaries were surveyed by boat and foot. All of these rivers are designated as Special Areas of Conservation (SAC). The highest densities of territories were found on the Boyne and Nore rivers with one territory every 8km. The kingfisher (*Alcedo atthis*) is listed in Annex I of the European Birds Directive, however to date no rivers have been designated as Special Protection Areas (SPA) for kingfisher or other riparian species such as dipper and sand martin. Together with additional data from the Ilen River (Co. Cork), the Bonet River (Co. Leitrim) and records from the public this survey will provide some of the information necessary for the SPA designation process so that these striking birds and their habitats will be given the protection that they need. Kingfishers are known to be susceptible to pollution, human disturbance and cold winters, and although the former two may have caused changes in distribution between 2008 and 2010, the cold winter did not appear to cause a decline in the population.



Kingfisher (Michael Finn)

Seabirds

Following a highly successful "Save our Seabirds" appeal and campaign, BirdWatch Ireland have stepped up a gear in our colony research and monitoring. Using small GPS loggers, we have mapped foraging ranges of three key species (shag, kittiwake and guillemot) at the most important colony on the east coast, Lambay Island (Dublin). This has been greatly aided by EU INTERREG Atlantic Area funding. This work will be expanded to key colonies on the west and south coasts next year. As we move into autumn our focus is switching to seabird migration, monitored through 'seawatching' from prominent headlands. We are coordinating a series of count-weekends through which we hope to track numbers and movements of the globally endangered Balearic shearwater *Puffinus mauretanicus* in Irish waters. For further information on this project, contact: seawatch@birdwatchireland.ie

Steve Newton, BirdWatch Ireland

Marine invertebrates



Rare anemone sighted at Rathlin island - From the many coloured jewel anemones that encrust tide exposed cliffs like a psychedelic carpet to the red and green beadlet anemones which cling in jelly tot like blobs to rocks on shore dives - anemones are sure to brighten up any dive. In the family Cnidaria (from the Greek for nettle) they are named for the stinging cells (nematocysts) which they feed with. These are not harmful to us (at least in British

and Irish species of anemone) but when a hair like trigger is activated by unwary prey (anything from zooplankton up) it causes a harpoon like structure to fire from the cell, penetrate the prey and fire the toxic cell contents into it. The toxin from a nematocyst will paralyze or kill the prey which the anemone then licks off its tentacles. The beautiful flower-like form of many anemones is a result of the body being

modified to allow as much exposure to potential prey as possible.

Jean Kennedy sighted the spotted burrowing anemone *Arachnanthus sarsi*, Seasearch diving on Rathlin Island recently. The record was made near the wreck of the Drake on a drift dive - although the species is known from the White Cliffs area of Church Bay it had not previously been recorded this Far East. This burrowing species can be distinguished from the common burrowing anemone by its much larger size (up to 20cm), lower number of tentacles (30 large ones and 30 smaller around the mouth) and the characteristic blue spots on its tentacles. This species is only known from a handful of sites on the west coast of Scotland and Ireland and Rathlin appears to be a stronghold.

The spotted burrowing anemone (Claire Goodwin)



It belongs to a group known as burrowing anemones which live in areas of mud, gravel or sand in a parchment like tube they create. Unlike other anemones they can't retract their tentacles into the column but instead are able to retract the whole body of the anemone into the sediment buried tube – a fact which has frustrated many an underwater photographer! This species is rare in Britain and Ireland and in the UK has been recognised as Biodiversity Action Priority species which makes it a priority for conservation.

Records of this species would be especially welcome – preferably with a photo to confirm identification. For further information on Seasearch Ireland please contact CFT (The Irish Underwater Council) on seasearchireland@cft.ie. The contact in Northern Ireland is seasearchni@googlemail.com.

Claire Goodwin, Ulster Museum

Phenology



Nature Watch at 3! (Months that is) - An exciting new website called Nature Watch was developed in collaboration with the National Biodiversity Data Centre. This website (<http://phenology.biodiversityireland.ie/>) invites members of the general public to participate in a national search for phenological data. This Citizen Science project requests interested parties to record the date on which they see the the first bird, the first insect, leaf fall and other phenological events in their surrounding environment throughout the year. The results of this research will give us a national view of when the seasons are occurring, and over the years will enable us to determine if advances in seasonal events between inter-dependent organisms, such as birds and their insect food resources, are remaining in sync. Nature Watch has been live for three months and already has had a steady stream of observations entered for the spring. Swallows and cuckoos are the two most popular species to observe, with wood anemone leading the plants. We encourage people to keep watching for phenological changes happening during the summer and fall, and to keep an eye out for insects!

Nature Watch is part of a growing number of websites across the world, which relies on nature lovers to contribute to scientific research. Throughout the USA, UK, Sweden and the Netherlands citizen scientists record phenological events throughout the year. These collaborations are extremely valuable to teach the general public about the scientific process and involving them in large scale studies with grateful scientists. We hope to shortly extend our website to display the data live on interactive maps!

Please visit the site <http://phenology.biodiversityireland.ie/>, or contact Dr Alison Donnelly if you have any questions Alison.Donnelly@tcd.ie.

Vascular Plants



Full of beans... and rare plants! - Passing a bean field, on the side of the N72 at Forestwood, Co. Wexford, I thought that I spied great brome *Bromus diandrus* amongst the bean crop. So I turned the car around and pulled into the field gateway. Then I realised I had been mistaken about it but, as there were a few corn marigolds *Glebionis segetum*, I decided to take a look. The farmer came along to see whether I had something to do with the new road that was to go through his field (the Enniscorthy-New Ross bypass). He said the local name for the corn marigold is 'yellow bottom' because of its yellow flowers and that I could pick them all if I wished.

But this stop proved to be very worthwhile as, under the crop the ground was pink with the minute flowers of narrow-fruited cornsalad *Valerianella dentata*. There must have been millions of these. I noticed another rare arable weed scattered between the rows of beans: dwarf spurge *Euphorbia exigua*.

I also spotted one plant of the very rare broad-fruited cornsalad *Valerianella rimosa* but as hard as I searched for I could not find any others. Doing some research, it proved that this is the first Irish record for this plant since 1962 when it was recorded from a root field at Borris, Co. Carlow and a cornfield at Clohamon, Co. Wexford. Both found by E. Booth and M. McCallum Webster. Unfortunately, in a couple of years time, they may all be gone because of the building of the new road.



Paul Green, Botanical Society of the British Isles

Broad-fruited cornsalad (Paul Green)



Bean field in Wexford (Paul Green)

Whales and Dolphins



Creating a stir in Dublin Bay – the first humpback whale in 20 years

The six month reporting period March to August straddles both the relatively quiet spring, and the busy summer period when IWDG are kept busy with sighting records. During this period IWDG received and validated 991 sighting records, of which 877 (88.5%) were categorized to species. June was the busiest month with 250 sighting reports, reflecting the peak period for basking shark sightings, which IWDG also accept.

As always the harbour porpoise was the most frequently reported species with 264 sighting events (26.7%), followed by basking shark 190 (19.3%), bottlenose dolphin 163 (16.3%), minke whale 104 (10.5%), common dolphin 76 (7.7%), Risso's dolphin 36 (3.6%), fin whale 18 (1.8%), killer whale 12 (1.2%) and humpback whale 7 (0.7%).

The late season flurry of large whale activity off the Hook Head area, Co. Wexford came to an end in late February, with the last fin whale record off Ram Head, Ardmore, Co. Waterford on 1st March. They remained absent throughout the spring, and

the 1st validated inshore record of a fin whale was on the 9th July, once again off Ardmore area. This trend

is likely to reflect a certain amount of observer bias, but

there is strong evidence now that

fin whales in particular are both leaving from, and arriving

off our south coast off the Wexford/Waterford area, where they are routinely detected from Andrew Malcolm's cliff top perch at Ram Head.

The species which captured the most media interest during this period, yet again revolved around a humpback whale, when a sub-adult appeared over a number of days off Co. Dublin. This animal created quite a stir by nudging sailing boats and interacting with people from 12th to 15th July between Dublin bay and Skerries. This was an extremely rare record of this charismatic species for the Irish Sea; the first in 20 years. But an earlier sighting of a humpback whale photographed off Rathlin Island on 11th July, and a subsequent sighting off Peel, on the Isle of Man on 23rd July would suggest that this may not have been the only humpback in the Irish Sea area at this time. Unfortunately, no images were obtained from any encounter which could tell us if this individual was previously catalogued in Irish waters.

August 22nd was All-Ireland Whale Watch day, an annual event which provides IWDG with a fascinating snap-shot of cetaceans around the Irish coast. This year's event comprised land based watches at 15 sites, from which sightings were made at 60% of sites, comprising 4 species: harbour porpoise, bottlenose dolphins, common dolphins and minke whales.

On the stranding front, between 1st March and 31st July 2008, IWDG received reports for 62 strandings of 65 animals – this would be fairly typical and for the same period in 2009 the records stand at 68 strandings of 99 animals. Roll on 2010 and the figures drop significantly. Between 1 March and 31 July 2010 IWDG only received 31 stranding reports involving 31 cetaceans. Less than half the anticipated number!



Fin whale, West Cork, 23rd of August 2010 (Pádraig Whooley)

As usual, harbour porpoises (9) and common dolphins (5) were the most frequently stranded cetaceans. But we don't know why the total numbers are down this year. Were there fewer dead animals, were there more easterly and northerly winds than usual, or do these figures simply reflect lower reporting effort? It will be interesting to see the trends in the coming years to establish if these results were a once-off.

All validated cetacean sightings and stranding records can be interrogated and mapped on www.iwdg.ie.

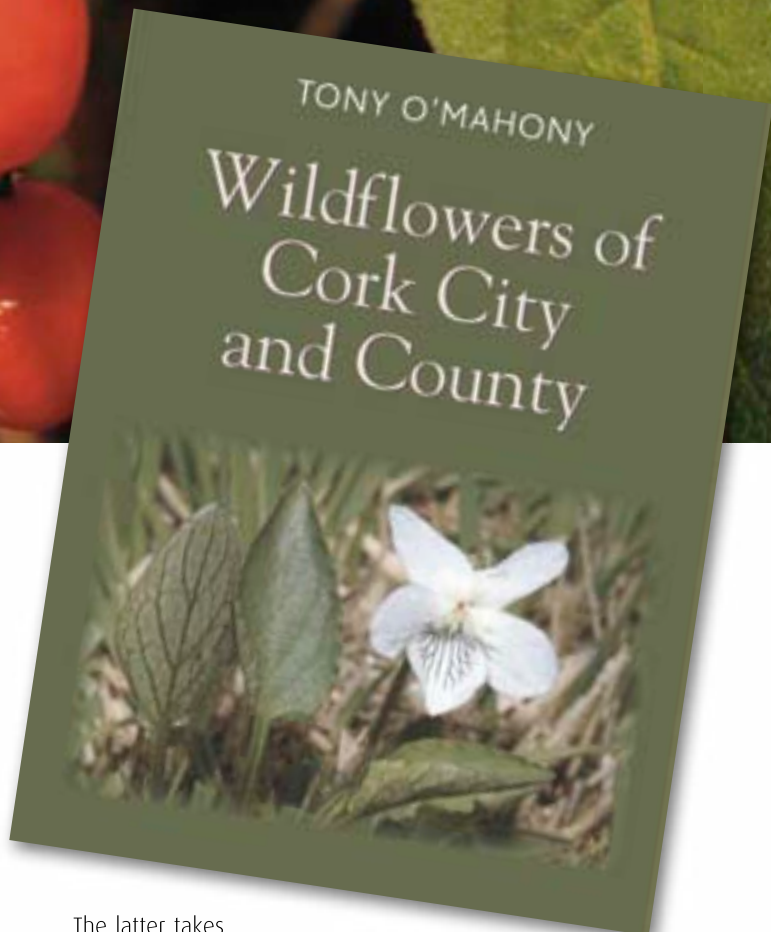
Pádraig Whooley and Mick O'Connell, IWDG

Book Reviews

From opposite ends of the country come two books from authors who clearly know and love their county

Two beautiful books have recently been published about the Irish flora – *Wildflowers of Cork City and County* by Tony O'Mahony (2009) and *The Flora of County Tyrone* by Ian McNeill (2010).

The first is directed towards the general reader and uses English followed by Latin names. It was funded by the Cork Local Authorities and the Heritage Council and is one of the County Heritage Plan actions. It follows a Praeger-like approach to Cork botany, discursive, detailed and instructive but lacking distribution maps. O'Mahony sets the scene with maps of physical features, geology and soils and then an introduction to the special features of the county flora and its biogeographical place in Europe. There is an account of past workers on the flora with interesting biographies of the names one sees attributed to old records. The meat of the book lies in the chapters about regions such as Cork City and environs, Cork Harbour and the Southwest peninsulas, followed by a discussion of those fascinating species that are shared with the Mediterranean or the Americas – the amphi-Atlantic species. As well as the well-known strawberry tree *Arbutus unedo* and large-flowered butterwort *Pinguicula grandiflora*, he draws attention to the Mediterranean affiliations of little robin *Geranium purpureum* and early sand-grass *Mibora minima*, two species closely associated with O'Mahony himself. The rest of the County is described by an overview of the different habitats. Woodlands and hedgebanks, Rivers, Mountains and uplands, even Inland and coastal wetlands, ponds and lakelets or The coast are tempting to read.



The latter takes us on a long walk from Youghal to Baltimore, beach by beach and bay by bay. Finally a series of chapters describes Cork orchids, ferns, the alien influx and naturalised and culinary plants – a welcome appreciation of this source of introduction.



Sea-holly (Tony O'Mahony)

Though lacking Praeger's fluency of language, O'Mahony clearly knows his stuff and his county. He deals in detail with favourite stamping grounds like Cork Harbour, the Blackwater Valley and the Lee but does not neglect individual corrie lakes, rock outcrops and fens. A separate topographical index directs one to many of these features. He clearly knows the sites intimately and is not averse to commenting on their management – or sometimes recording their destruction. A final chapter of the book discusses nature conservation issues and notes the hotspots of Cork biodiversity. It includes a plea to conserve small ponds and ditches often passed by in the rush to larger and more famous areas. He also labels winter heliotrope *Petasites fragrans* as the greatest alien threat.

The text is filled with arresting photographs, taken by the author, Michael Troy and others. Some are slightly over-enlarged but they lighten the text considerably, illustrating at least a hundred different species. Some of these are some rare, some common, but many allow for the identification of the plant in question. They include such unlikely subjects as sand dune cornsalad *Valerianella locusta* var. *arenaria*, pale galingale *Cyperus eragrostis* and prickly sedge *Carex muricata*.

This is definitely a book to be dipped into; with an hour to spare at the Awbeg River, at Rochestown or Gurtaveehy Lough, O'Mahony is a valuable guide to the delights of the area. A full indexing system justifies much of the data and yields a total of 20 pages of references and bibliography.

Wildflowers of Cork City and County

by Tony O'Mahony

The Collins Press

€29.99 (including p&p)



The Flora of Co Tyrone is unashamedly a county flora but a beautiful and inspiring one at that. Robert Thompson's photographs shine out from the text and are some of the best botanical ones I have seen. This is not to decry Ian McNeill's text which is both easy to read and informative. After some introductory sections of abbreviations and maps McNeill writes of the topography and botany of the county, first quoting Praeger's commentary of 'a curiously negative tract with a paucity of outstanding features...' and then disproving it with a survey of botany from the Lough

Neagh shores to the Foyle valley and the wild west of Tyrone, around Castledearg. He admits the Sperrin Mountains can be dull in the extreme but writes winningly of Tyrone's lake district from Dungannon to Aghnacloy along the Blackwater, and the limestones about Drumquin. He gives lists of characteristic plants, tantalising to the southern botanist and reminding us how varied the whole island is, north to south as well as east to west. Armed with this section the visiting botanist would be well equipped to explore the county.

Chapters 4 & 5 about climate and geology are written by Nicholas Betts (QUB) and Philip Doughty (Ulster Museum) and so are authoritative if not directly correlated with the botany. Then McNeill tells us the history of botanical recording in Tyrone which only started with Knowles in 1897. He stresses the importance of Harron's flora of Lough Neagh and goes on to describe his own work over the last thirty years, an obvious source of enjoyment and perhaps an antidote to mathematics teaching!

Four short chapters introduce us to the records themselves – the first gives a potted biography of the main recorders of plants, the second interprets Tyrone place names from their Irish originals and involves both descriptive and botanical terms. This is a valuable feature not widely found in floras and of considerable interest. The third gives us a gazetteer of the county (with grid references) which is invaluable for the later records, while the fourth is a habitat gallery and describes an eclectic mix of sites, mostly accessible and all with interesting plants.

The systematic section fills the later two thirds of the book and is all that it should be. He works through each species giving a list of records and mapping the more frequent species in 5x5km squares. The scale is such that many of the distribution maps suggest the habitat preferences of the plant. Together they represent an immense amount of work of which any county recorder could be happy and for which we should be eternally grateful to Ian McNeill. We should also be grateful for his proof-reading, something that this reviewer has not been able to fault, except for an unfortunate caption on the frontispiece!

The book ends with two short lists of brambles and dandelions in the county, those bugbears of species which bedevil work for the field botanist.



Bee Orchid (Tony O'Mahony)

Roger Goodwillie, Lavistown House, Co. Kilkenny

The Flora of County Tyrone

by Ian McNeill

The National Museums Northern Ireland

€31.60/£27.00 (including p&p)

Biodiversity Beginners - Bumblebees



The charismatic bumblebee is a key component of our wildlife, busily spending spring and summer pollinating our crops and native plants. Like honeybees, bumblebees are highly social insects and live in colonies consisting of a queen, many female workers and some males.

The good news is that learning to identify the different bumblebee species we have in Ireland is not difficult and can be done without harming the bees. They are identified by the colour pattern on their thorax and abdomen. We commonly think of black and yellow stripes, but there are lots of other colour patterns to watch out for.

What do you need?

You'll find that, with experience, you can identify bumblebees on the wing or when they're foraging, but initially a butterfly net is very useful. You'll also need something to gently put the bee into, while you have a look at its colour pattern. A Ziploc sandwich bag or transparent specimen tube are ideal. When you're learning to identify bees it can also be very useful to take a photograph for validation by an expert.

Have a look at their tail colour

Ireland has 14 species of true bumblebee. Two of these (*Bombus magnus* and *B. cryptarum*) are very closely related to their sister species *B. lucorum*, and can only be reliably distinguished using DNA analysis. *B. lucorum* is very common and when observed should be recorded as *B. lucorum* aggregate. This brings the number of true bumblebee species to recognise in the field down to 12.

For bumblebees, the key identification feature is the colour of their tail. Of the 12 true bumblebee species; four have a white tail, five have a red tail, one has a ginger tail and two have a blonde tail.

The four white tailed species can be distinguished from each other by checking whether there are one or two yellow bands on the thorax, and if the bee has a long or short face.

The five red tailed species can also all be easily identified. The mountain bumblebee, *B. monticola*, not only has a red tail, but at least half of the abdomen is a rich red colour. It's a very distinctive bee that is found only in counties Antrim, Dublin, Wicklow, Carlow and Wexford and is associated with bogs and heaths as it needs to feed on Bilberry. Watch out for *B. lapidarius* which is entirely jet black with a red tail and is often found in gardens.

The ginger tailed species, *B. pascuorum*, is very common and also has a ginger thorax. Both of the blonde tailed species have not only a blonde tail, but an entirely blonde abdomen. *B. muscorum* has a blonde abdomen and a ginger thorax, while *B. distinguendus* (Great yellow bumblebee) has a blonde abdomen and a blonde thorax with a distinctive black band. The Great yellow bumblebee is almost extinct in Ireland and is now known from only a few flower rich areas on the west coast.

In addition to the 14 true bumblebees, Ireland also has six cuckoo bumblebee species. Cuckoo bumblebees don't make their own nest, but instead lay their eggs in the nest of their true bumblebee host. They are rare relative to true bumblebees, but can similarly be identified by the colour pattern of their thorax and abdomen.

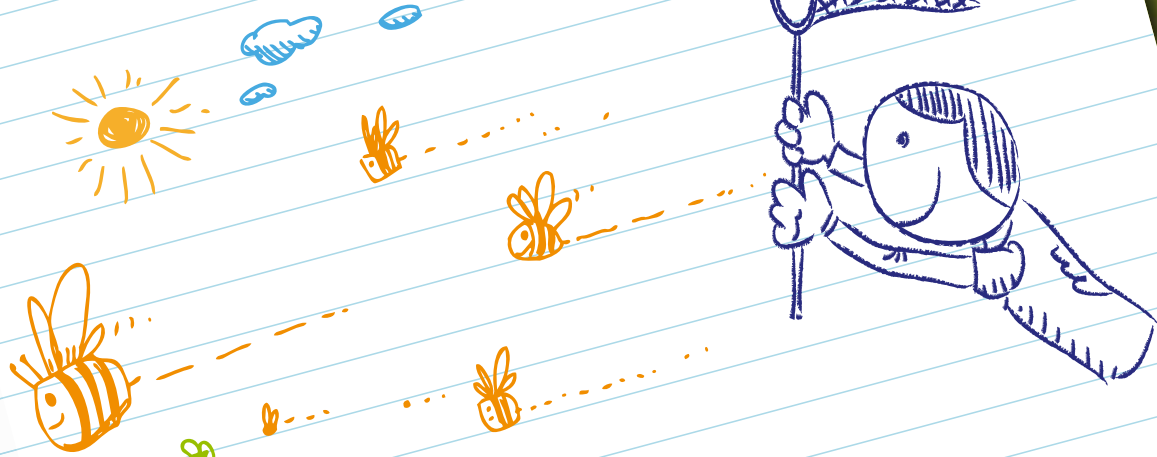


Bombus L
§ *B. pa*

(J.Breen)



*lapidarius
scurorum*



B distinguendus queen,
worker & male

B lucorum queen
& worker

Bumblebee identification is straightforward, but can seem like a lot to take in at first. In the Data Centre we have recently produced a swatch identification guide to Ireland's bumblebees. Within the swatch, the true bumblebees are grouped by tail colour so when you see a white tailed bumblebee you can fan out images of Ireland's four white tailed species and work out which one it is. Each page in the small pocket-sized swatch has colour paintings of a bumblebee species on the front side, and identification tips on the back. The swatch also includes images and tips on identifying the six cuckoo species. The bumblebee swatch is available to buy at a cost price of three euro during all Data Centre events.

The beauty of bumblebees is that you don't have to look hard to find them. As long as it's sunny and there are flowers, they'll be there waiting to be identified! Only female bees can sting but they're not generally aggressive unless severely disturbed. Unlike honeybees, bumblebees can sting more than once though, so best to be cautious!

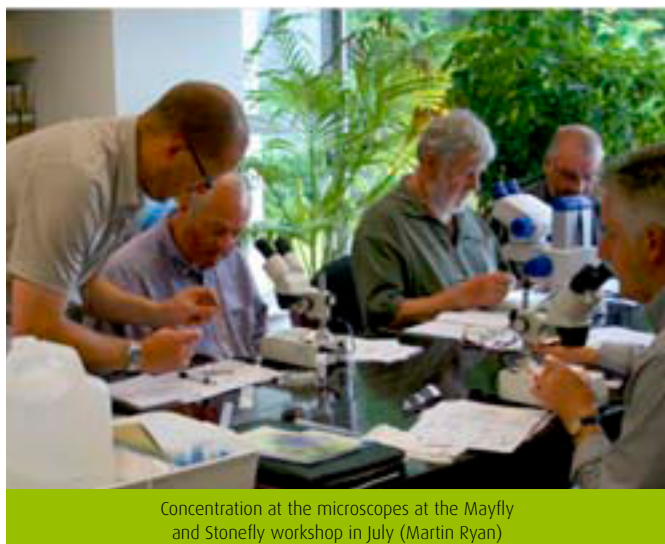
The National Biodiversity Data Centre is collating Irish bee data and would be delighted to receive records of bumblebees.



News from the Centre

Identifying and Recording Ireland's Biodiversity 2010

To celebrate International Year of Biodiversity 2010, the National Biodiversity Data Centre held an exciting programme of workshops along with its partners (Burrenbeo, Connemara National Park, Compass Informatics, Fota Wildlife Park, Irish Peatland Conservation Council, Wexford Wildfowl Reserve, Seasearch, and Shannon Dolphin and Wildlife Centre). There were 14 workshops in total, including introductions to identifying earthworms, centipedes and millipedes, mayflies and stoneflies, invasive species, ladybirds, bumblebees, grasses, sphagnum mosses, a workshop on the uses of wild plants in Ireland. There were two on the Irish Butterfly



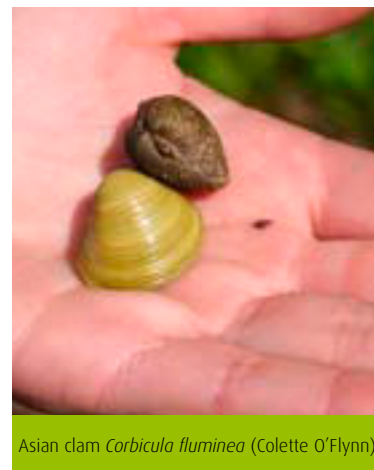
Monitoring Scheme, one on small mammal surveying, and one in partnership with Seasearch on recording marine organisms. They were extremely successful workshops, generating genuine interest and knowledge in Ireland's biodiversity. Thank you to the leaders and participants for stimulating, enjoyable days!

Wild relatives

The Data Centre has developed an exciting new project in partnership with the Department of Agriculture and the National Botanic Gardens looking at the wild relatives of crop plants. These plants constitute an increasingly important resource for improving agriculture production and for maintaining sustainable agro-ecosystems. The project, co-ordinated by Dr. Úna Fitzpatrick and Dr. Darach Lupton, will establish a national database for the location of these plants in Ireland.

Alien update

Summer 2010 has been a very busy time for the National Invasive Species Database project. The Data Centre hosted a European workshop on developing an early warning information system for Europe. The system developed by the Data Centre for Ireland was showcased to delegates from 16 European countries and has potential for other European countries.



As part of Ireland's invasive species early warning system, two recent Species Alerts issued were:

Asian clam (*Corbicula fluminea*) was first recorded in Ireland on 13 April by Pascal Sweeney. Like the zebra mussel, Asian clam has the ability to become highly invasive in a short period of time and have huge detrimental effects on our native biodiversity. Inland Fisheries Ireland have responded rapidly to the alert.

A Chipmunk, possibly Siberian Chipmunk (*Tamias sibiricus*), was photographed in Co. Waterford on 10 August. A lone chipmunk is not of concern, however if significant populations were to establish in Ireland they could have a negative impact on the native red squirrel. Impact on predation of ground nesting birds has been documented in some other European countries.

Please note it is illegal to release any non-native species into the wild in Ireland. For further information, go to the National Invasive Species Database at <http://invasives.biodiversityireland.ie>.





1.5 million records and still expanding... Biodiversity Maps

The National Biodiversity Database now contains over 1.5 million records of almost 9,000 species. The first records loaded to our mapping system was in August 2008. So a full two years later, we have reached the 1.5 million mark. With the launch of the marine mapping system, we hope to have over 2 million records by the end of 2010. Not bad for two years work, if we do say so ourselves! Databases recently uploaded to the mapping system include:

Irish Butterfly Monitoring Scheme

9,326 records of 31 species

Badger and Habitats Survey of Ireland

6,769 records of 13 species

Butterflies – Irish Wood White Database

187 records of 2 species

The Second Atlas of Breeding Birds: 1988-1991

247,842 records of 175 species

The First Atlas of Breeding Birds: 1968-1972

63,985 records of 144 species

The First Atlas of Wintering Birds: 1981/81-1983/84

55,690 of 205 species

NPWS Seal Database

1,210 records of 3 species

Heritage Trees of Ireland

722 records of 143 species

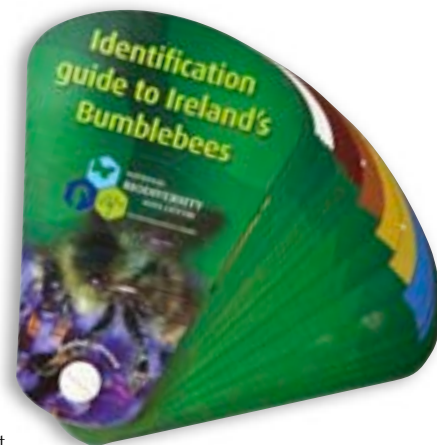


Filming for RTE Six One News (Eugenie Regan)

Irish butterflies in the limelight...

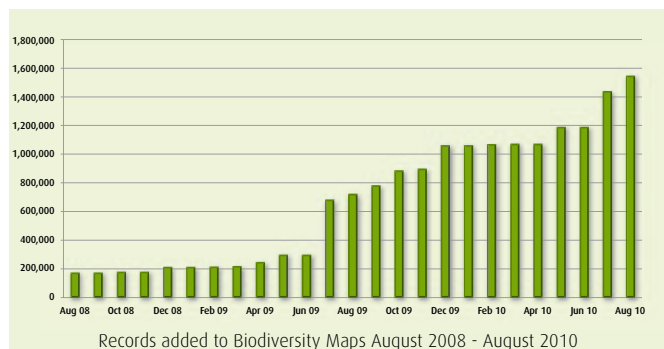
The Irish Butterfly Monitoring Scheme is going from strength to strength. After the profile on Morning Ireland, RTE1 in April, the scheme now has over 130 volunteers walking butterfly transects across the country. The enthusiasm and dedication of our volunteers is just fantastic.

This data is not only important for butterfly conservation at a national level, but we are now working with over 15 European partners and sharing this data at a European level. This has resulted in a report to the European Environment Agency and shows that grassland butterfly numbers have declined by 70% since 1990.



Bumblebee identification swatch

A series of identification swatches for Ireland's biodiversity have been launched by the Centre. The first is on Ireland's bumblebees and covers all Irish species. It was put together by Úna Fitzpatrick and Andrew Byrne with illustrations by Bryan Pinchen. Further swatches that we hope to develop include shieldbugs, grasshoppers and crickets, and ladybirds.





Biodiversity connections

National Biodiversity Data Centre Websites

Irish Butterfly Monitoring Scheme -

<http://irishbutterflymonitoringscheme.biodiversityireland.ie/>

National Invasive Species Database -

<http://invasives.biodiversityireland.ie/>

Nature Watch - <http://phenology.biodiversityireland.ie/>

Flora of County Waterford -

<http://floraofcountywaterford.biodiversityireland.ie/>

National Vegetation Database -

<http://nationalvegetationdatabase.biodiversityireland.ie/>

Water Beetles of Ireland - [http://](http://waterbeetlesofireland.biodiversityireland.ie/)

waterbeetlesofireland.biodiversityireland.ie/

Biodiversity Maps - <http://maps.biodiversityireland.ie/>

Some current Irish recording projects

- **Irish Butterfly Monitoring Scheme**
irishbutterflymonitoringscheme.biodiversityireland.ie
- **National Invasive Species Database**
invasivespecies.biodiversityireland.ie
- **Ecojel** - www.jellyfish.ie
- **Seasearch Ireland** - seasearchireland@gmail.com
- **Purse Search Ireland** - www.marinedimensions.ie
- **Irish Basking Shark Project** - www.baskingshark.ie
- **ISCOPE (Irish Whale and Dolphin Group)** - www.iwdg.ie
- **Orchid Ireland** - www.habitas.org.uk/orchidireland
- **Bird Atlas 2007-2011** - www.birdwatchireland.ie
- **Batlas 2010** - www.batconservationireland.org
- **Butterfly Ireland** - www.butterflyireland.com
- **Moths Ireland** - www.mothsireland.com
- **Lichen Ireland** - www.habitas.org.uk/lichenireland



Upcoming national events

15 & 16 October	Birds, Bats & Bugs The Ceramics Room, National Museum of Ireland - Archaeology Kildare Street, Dublin 2
2-4 November	Biodiversity Beyond 2010 IEEM Annual Conference, Dun Laoghaire
10 - 13 November	14th Conference of the European Elasmobranch Association, Galway
6-8 April	Environ 2011, UCC

The National Biodiversity Data Centre is an initiative of the Heritage Council and is operated under a service level agreement by Compass Informatics. The Centre is funded by the Department of the Environment, Heritage and Local Government.