PRIFYSGOL ABERYSTWYTH UNIVERSITY

Countryside and Environment

NEWSLETTER 2016

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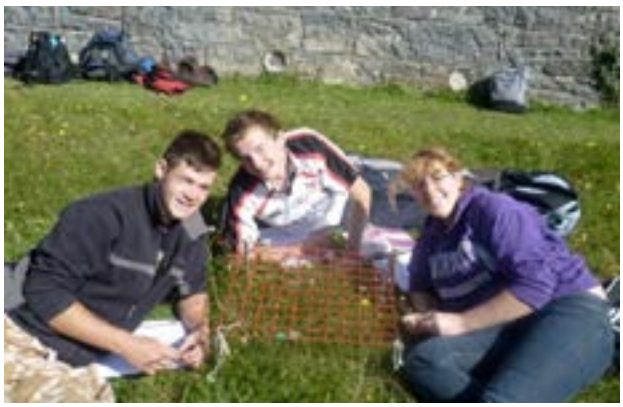
IBERS Institute of Biological, Environmental and Rural Sciences

Burren Fieldcourse, West of Ireland



The Terrestrial Ecology Field Course is based in the Burren in County Clare on the west coast of Ireland. The Burren (where Father Ted lives) is a vast expanse karst landscape formed by the action of glaciation and high rainfall on limestone rocks. The result is a strange moonscape, with sinkholes and vanishing lakes but also some fascinating biological communities, combining both Arctic-alpine and Mediterranean species. Students from Aberystwyth have been visiting the Burren and studying its ecology for over 40 years. These days we stay at Galway University's fieldstation in Carron where the key habitats of the Burren, hazel woodlands (Celtic rainforest), limestone pavement grasslands and turloughs are at our doorstep. The focus of the course is plant and fungal ecology but we also study the role of man in forming the present Burren habitats and the issues of rural decline, agricultural subsidies, scrub encroachment and rare species conservation. The first four days involve a series of class exercises and bus tours, with the last two days comprising a more detailed group project. For evening relaxation Cassidy's Bar and its traditional music is only a 10 minute walk!

List of Courses

BSc
Countryside Conservation
Countryside Management
Ecology
Environmental Bioscience
Plant Science

Foundation Degree
Countryside Management and Conservation

Interested?
Phone **Ian Keirle** on **01970 621636**

Study reveals north/south genetic divide in Welsh Red Kite

Aberystwyth University postgraduate student Ilze Skujina recently studied the modern Red Kite population in Wales and revealed a north/south genetic divide that runs along the Towy Valley. The research was undertaken as part of a project to provide guidance on the long-term conservation of the Red Kite.

Ilze said; "I accompanied Professor Mike Hayward of the Welsh Kite Trust and Tony Cross of Ecology Matters and Consultant Ornithologist to the Welsh Kite Trust, on their nest monitoring and chick tagging visits across the traditional core areas of the species in Wales and the contact areas between the expanding Welsh and English populations in Shropshire and Herefordshire and gathered cast feather samples and extracted DNA from the feathers.

"This proved to be an efficient and most importantly, non-invasive way of collecting DNA. The molecule acts like a bar-code and provides geneticists with information about the relations between populations and individuals. "Using the cutting edge facilities in the Translational Genomics laboratory at IBERS and novel genetic markers developed in our lab, I was not only able to reconfirm that the modern Welsh kite population still falls into a Northern and Southern groups (as had been detected in the 1980s using the single genetic fingerprint probe available at the time) but also detect a genetic difference between the older Central-Welsh and the relatively new Red kite population in Shropshire and Herefordshire."

IBERS enters University Challenge – with a difference!

The Royal Botanical Gardens at Kew is set to host the first ever Botanical University Challenge in March. The event is being organised jointly by IBERS and the University of Reading. The role of Paxman is being taken by TV celebrity ethno-botanist James Wong. We are taking a strong team of undergraduate and post graduate students to the event and are quietly confident that we can beat both Oxford and Cambridge teams to lift the trophy at the end of the day.

Interpreting the Iron AGE

Students on the third year Interpretation and Environmental Education module recently visited the reconstructed Iron Age hill fort of Castyll Henlys in the Pembrokeshire National Park. Whilst there they discovered how the site is used for educational activities with school groups and the power of experiential interpretation as a learning tool. Learning how to communicate messages to the public and to children is an important skill for people working in the countryside sector.

Grazing and atmospheric pollution impacts on the upland ecosystem

PhD student, Will Stiles is close to completion of his three year research project to investigate how nitrogen from atmospheric pollution and grazing herbivores affect the upland ecosystem. Differences in vegetation, soil chemistry (including carbon), carbon dioxide and methane emissions and the abundance of selected soil arthropods were recorded during numerous visits to the remote study sites on Pumlumon and Pwllpeiran. The observations were related to differences in the stocking density of grazing livestock and atmospheric deposition of nitrogen. Phosphorous and nitrogen was also deliberately added to small experimental plots to identify limitations imposed on the diversity and productivity of the wet and cool uplands. Blanket bog, heath and acid grasslands are all enriched by nitrogen contributed by livestock production and atmospheric deposition, and in combination, exceed the recommended critical load, with the consequence of a reduced plant species diversity but increased soil bacterial activity that, in turn, causes an increased rate of loss of carbon from soil. Phosphorous is a limiting factor in the upland habitats that experience chronic nitrogen saturation and the stimulation of vegetation growth and ecosystem productivity could well mop up surplus nitrogen. Phosphorous was observed to further reduce plant species diversity in favour of mosses and raise soil microbial activity, and culminated in an even greater loss of carbon, partly as increased emissions of harmful greenhouse gases.

Lucky four-leaf clovers in the sub-arctic could prove valuable to future plant breeding

This year some of the second year students from our Environmental courses took part in a 10 day field course in Abisko, North Sweden. This course is used to illustrate the global importance of sub-Arctic ecosystems communities and considers how future climate change will impact upon them. Whilst there they discovered lots of four-leaf clovers! This lucky discovery could prove valuable to future plant breeding research. The students found that many of the clovers had four, five and even six leaves. Ecology student Kate Gwynn said "We have seen some amazing fauna and flora in this area but did not expect to see four leaf clovers in the sub-arctic region". IBERS is a world leader in grass and clover breeding and has an active red clover breeding programme.

Five-leaf Wild Red Clover

Daddy longlegs and an ecosystem under threat from climate change

Cranefly, which is more commonly known as daddy longlegs

Several rare upland bird species such as dunlin, golden plover and red grouse are being put at risk by the effects of climate change on the UK's blanket bogs, ecologists at Aberystwyth University and the University of York, have discovered. The research which involved collaboration with the British Trust for Ornithology, and the University of Leeds and part-funded by the RSPB, showed that the humble cranefly, more commonly known as 'daddy longlegs', is a crucial link in determining the impact of climate change on these peatland bird species.

The birds depend on the protein rich craneflies as food for chicks, but scientists have discovered that summer droughts, which are predicted to increase, will cause significant declines in craneflies numbers and subsequently the bird species that depend on them.

The research suggests that large-scale projects to restore degraded and eroded blanket bogs could be critical in securing the future of these internationally important bird populations, alongside both water supplies and the crucial role of blanket bogs as a carbon store.

New book explores why we eat the plants we do

Professor John Warren from IBERS has recently published a best-selling book on why we only eat certain varieties of plants. *The Nature of Crops – How we came to eat the plants we do*, explores the reasons why we only eat a tiny 1% of the 40,000 plants available whilst the potential is far greater. Professor Warren said:

"Wheat, rice, potatoes and cassava are all crops that were domesticated a long time ago. I strongly believe that we should still be domesticating new crops as we do in IBERS if we want to make the world a better place. The book takes the reader on a journey through our history with crop plants. Arranged into recurrent themes in plant domestication, it documents the history and biology of over 50 crops, including cereals, spices, legumes, fruit and cash crops such as chocolate, tobacco and rubber.