

NEWS

Dublin City of Science and the EuroScience Open Forum

Prof. Gretchen Daily will be a guest of the TCBR at the ESOE in Dublin in July and has kindly agreed to give a talk in Trinity during her visit to Dublin. Gretchen, an ecologist by training, is the Director of the Centre for Conservation Biology at Stanford University.



Photograph courtesy of nytimes.com

She is the author of the very influential book "Nature's Services: Societal Dependence on Natural Ecosystems" published in 1997. Her work spans scientific research, teaching, public education, and working with leaders to advance practical approaches to environmental challenges. Her scientific research is on countryside biogeography and the future dynamics of biodiversity change; on the scope for harmonizing biodiversity conservation and agriculture; on quantifying the production and value of ecosystem services across landscapes; and on new policy and finance mechanisms for integrating conservation and human development in major decisions. Her seminar will be on Thursday 12th July 2012 in TCD.

TCBR Biodiversity Marketing Group win award for novel outreach ideas

The biodiversity forum, largely lead by postgraduate researchers, contains three active working groups: (1) Dublin City of Science audio tour group, (2) Invasive species group, and (3) Biodiversity in Our Lives.



Photograph courtesy of Miles Newman

An offshoot of working group 3 is the biodiversity marketing group which is led by postgraduate researcher Eileen Diskin. The biodiversity marketing group focuses on promoting awareness of biodiversity in our everyday lives and recently entered the Trinity Foundation competition: Small changes-Big difference with a variety of novel ideas on how to best market biodiversity to a general audience. The proposal was a success and the team were allocated more seed money than they had applied for. Congratulations to the group, we look forward to seeing the fruits of their labour.

Green Week Seminar on Biodiversity

As part of the 10th annual Trinity College Green Week, the TCBR hosted Éanna NíLamhna, well-known environmental commentator, regular on RTE's Mooney Radio Show and author of "Wild Dublin", who gave a very witty and engaging talk on Dublin's Biodiversity. Éanna described the variety of species to be found in Dublin and told some great stories about these species and their interactions with people.



Photograph courtesy of Dr. Jane Stout

TCBR City of Science Biodiversity Audio Tour

The TCBR was awarded a small grant by the ESOE 2012 Dublin City of Science organisation committee for a proposal under the topic of Public Participation Events.

For this event the TCBR will be creating a Biodiversity Audio Tour of Dublin City. Dr. Caoimhe Muldoon was recently appointed as coordinator of the project, and will be putting together an exciting and engaging audio programme, with potential for collaboration with Arc's Hack the City Exhibition interactive biodiversity map.

TCBR Researcher wins award for best forestry presentation at ENVIRON 2012

Congratulations to Dr. Karen Moore who gave a wonderful oral presentation at the ENVIRON conference in UCD on Friday 8th March. Her presentation focused on "Factors influencing the ground vegetation diversity of two successive rotations of non-native conifer plantations".

NEWS

Overplaying the role of honeybees as pollinators

TCBR researcher Dr. Jane Stout in collaboration with other international experts recently published an important comment paper following a publication by Aebi and Neumann (2011). The paper highlights the danger of accepting unsupported biodiversity-conservation argument. The value of honey bee research is widely advocated in both published and broadcast media, despite the fact that native bumblebees, which are under much greater threat of extinction, are far more important as pollinators of both crop plants and native wild plants.

Their paper can be found at: [www.cell.com/trends/ecology-evolution/fulltext/S0169-5347\(11\)00353-3](http://www.cell.com/trends/ecology-evolution/fulltext/S0169-5347(11)00353-3).

BioChange Synthesis Report now available

BioChange was an interdisciplinary study funded by the Environmental Protection Agency (EPA). The aim of the study was to address issues facing biodiversity in Ireland now and in the future by providing a cohesive research framework, with direct links to both regional and national policy.



<http://www.epa.ie/downloads/pubs/research/biodiversity/>

Agrobiodiversity Conference (NUIG)

Ireland's first Agrobiodiversity Conference, funded by the Department of Agriculture, Food and Marine (DAFM), was recently hosted by NUIG on the 9th of February, 2012. The conference featured guest speakers from around the World, with a rich wealth of expertise. The aim of the conference was to network and showcase research projects and initiatives in Ireland for the conservation and sustainable use of genetic resources (agrobiodiversity) for food and agriculture, in the context of assessing the sustainable development challenges facing Ireland with regards to genetic resource conservation and food security.

The conference was a great success and will hopefully be an annual event. The key points recurring throughout the day centered on the fact that we need to strive to broaden the genetic base of the crops we require for food. Conor Gretsch from COHAB summed up the general feeling from the conference by stressing our need to show foresight

"Sustainable development must be our goal, genetic resources which may not seem important now may become important in the future".

More information about the conference can be found at: www.agbiodiversity.org

Our Ocean Wealth- Public Consultation

The government are in the process of developing an Integrated Marine Plan for Ireland. This is open to public consultation. Help ensure the government utilises our marine resources not only in an economically sustainable way but also in an ecologically sustainable way.



Photograph from ouroceanwealth.ie

We constantly hear about the missing link between research and policy, here is a chance to play your part in informing marine policy-makers by having your say. Visit ouroceanwealth.ie to find out more. The consultation will be open until the 31st of March 2012.

PUBLICATIONS

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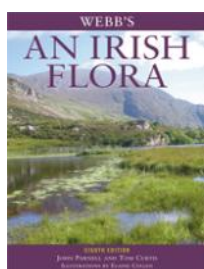
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RESEARCH FOCUS

When marriage is good for your genes

TCBR researchers recently published a paper in the *Proceedings of the National Academy of Sciences of the USA* showing that marriages within small farming communities in Africa may influence the genetic diversity of manioc, a crop cultivated pantropically for its starchy, edible root often referred to as cassava. Marc Delêtre, Doyle McKey and Trevor Hodgkinson analyzed how crop landraces are passed on from one generation to the next, using the example of maniocin Bantu societies of Gabon, central Africa. They collected and genotyped varieties grown in 10 communities in Gabon, and found that the genetic diversity of manioc clustered into distinct geographic regions, with the greatest diversity found in the southern part of the country, and the lowest diversity in the north. The authors suggest that regional differences in diversity may reflect in part the different marital practices in the two regions: in the south, where societies are matrilineal (i.e., children take the clan of their mother), a new bride moves to her husband's village and brings along manioc varieties from her mother's farm, whereas in the north, where societies are patrilineal (i.e., clan membership is inherited from the father), new brides move empty-handed and receive manioc varieties from their mothers-in-law. The result is that in patrilineal societies there is no inflow of manioc cuttings accompanying the inflow of women. According to the authors, understanding the relationship between marriage exchanges and inter-generational transmission of crop seeds may help decipher geographical patterns of crop diversity.

For full detail see:

Delêtre m, McKey BD and Hodgkinson TR (2011). Marriage exchanges, seed exchanges, and the dynamics of manioc diversity. *Proceedings of the National Academy of Sciences of the United States of America* 108: 18249-18254.



Photographs courtesy of Dr. Trevor Hodgkinson

RESEARCH FOCUS

Comparative Phylogenetics Research

We are delighted to welcome Dr. Natalie Cooper to the TCBR team. Natalie has recently taken up position as a lecturer in the Zoology Department, and leader of the Comparative Phylogenetics Research Group.



Photograph courtesy of
Dr. Natalie Cooper

Natalie's research interests lie at the intersection of ecology and evolution. Although she has mainly worked on mammals in the past she has an interest in all things biodiversity related. Her work utilizes phylogenies, ecological data, trait data collected from museum specimens, species geographic range maps and various databases to try and understand how community-level ecological interactions, such as competition, predation and parasitism, can influence broad-scale patterns of biodiversity and macroevolution. Natalie's PhD research focused on using phylogenies to detect interspecific competition in mammals, whilst her additional research has investigated patterns of extinction risk in frogs. Most recently she has been using phylogenetic comparative methods to investigate phylogenetic niche conservatism in terrestrial vertebrates, and to predict parasite sharing among primates and humans. She is also interested in developing and testing phylogenetic comparative methods.

At TCD she plans to extend her analyses by adding extinct species into phylogenetic trees to see how extinct diversity may influence the conclusions of evolutionary ecology studies. She also aims to carry out some comparative genomics and field work, mainly through a project on adaptive radiation in Malagasy Tenrecs, which her PhD student will be starting in October 2012.

Patches in *Miscanthus*: Consequences for yield, carbon sequestration and biodiversity

Within the last six years the bioenergy crop *Miscanthus x giganteus* has been introduced into the Irish landscape on a large scale. The promise of high biomass yields and low maintenance costs have moved the Irish government to support farmers planting *Miscanthus* with subsidies covering up to 50% of establishment costs. In December 2011 the Dpt. for Agriculture, Food, and the Marine started a new 2012

bioenergy scheme supporting the plantation of another 1400 ha of *Miscanthus* and willow with a €1.6m fund.

Recent research by TCBR members has shown that *Miscanthus* also provides additional ecosystem services. Dara Stanley's research indicates that solitary bees, wasps, and butterflies can benefit from *Miscanthus* fields, subsequently supporting the pollination of surrounding insect pollinated crops and wild plants. Jesko Zimmermann measured significant soil carbon sequestration rates under *Miscanthus*, showing additional greenhouse gas savings and benefits for soil fertility. However, during the field surveys large open patches within the crop could be observed within most fields. This has negative impacts on the biomass yield and soil carbon sequestration. Former TCD researcher David Styles and TCBR member Mike Jones showed that under current market conditions in Ireland the gross margin of *Miscanthus* is very low, leading to a situation where even these small losses could be essential to profitability. In a recent experiment Jesko Zimmermann measured significantly lower carbon sequestration rates in the open patches and is now working on a farm scale assessment of the potential loss of both carbon sequestration and yield.



Photograph courtesy of Susannah Cass

The effect of patchiness on biodiversity is more complex. Two recent MSc theses by Kate Harte and TCBR member Susannah Cass have shown impacts of open patches on both flora and fauna. Susannah's research indicated that light availability, in interaction with other crop related factors had a major impact on non-crop vegetation. However non-crop vegetation height was negatively influenced by patch size. Kate found that non-crop vegetation cover had a positive influence on spider and carabid activity density, and that the total invertebrate abundance was positively related to non-crop vegetation height. Open patch size, however, had a negative impact on total invertebrate abundance. Although data on the influence of patch size on yield is missing, preliminary data suggests that open patches have a significant negative impact on economic factors such as yield and offer no clear benefit on biodiversity.

RESEARCH

Draft Guidance Manual on Integrated Biodiversity Impact Assessment Available for Consultation

The draft Guidance Manual on Integrated Biodiversity Impact Assessment (IBIA) is currently being reviewed by international experts and will soon be available for wider public consultation. The purpose of the Manual is to provide guidance on how best to integrate the methodological processes for Appropriate Assessment under the Habitats Directive and environmental assessment, including both Strategic Environmental Assessment and Environmental Impact Assessment. It contains clear and practical recommendations on each of the methodological steps, including the application of GIS techniques and a comprehensive list of biodiversity datasets available in Ireland, together with a 'step-by-step' IBIA guidance.

The aim of IBIA is to ensure that the relevant processes required under the different EU directives and national law connect effectively and efficiently in order to provide a holistic approach to biodiversity impact assessment, optimise time and resources, and avoid unnecessary duplication of efforts. Moreover, its objective is to inform the scope and outcomes of the different processes in a timely manner and encourage best practice.

The draft Guidance Manual is the direct outcome of the EPA-funded 'GIS-supported Methodology for Integrated Biodiversity Impact Assessment' in which TCBR members Dr. Ainhoa González and Professor Mike Jones are collaborating with UCD and consultants ScottCawley Ltd.

More information can be found at: www.ucd.ie/ibia.

How can flamingos help us solve one of the greatest threats to human health?

Research being carried out by TCBR PhD student Eileen Diskin under the supervision of Dr. Alison Donnelly demonstrates how collaboration with experts both within and outside of the area of biodiversity can benefit research projects. Her research focuses on evaluating the prevalence of antibiotic resistance in natural environments, and has involved collaborations with wildlife biologists, microbiologists, geneticists, and more.

Antibiotic resistance describes when bacteria can survive exposure to antibiotics. Stories about these bacteria appear in the news due to their very serious implications in hospitals – see the well-publicized MRSA. In addition to being problematic in hospitals and urban environments, antibiotic resistance bacteria have been found in natural environments.

FOCUS

Within these natural environments, wildlife can act as reservoirs (i.e. stores) of antibiotic resistance, with the potential for transfer back to humans. To investigate this, Eileen is using the Greater Flamingo as a model organism to investigate the factors that may promote, or drive, the prevalence of antibiotic resistant bacteria in natural environments. In the first year of her PhD she visited five sites in Southern Europe to collect bacterial samples from flamingos. She is currently working in Dublin University Dental Hospital's microbiology lab analysing these samples to determine resistance to several antibiotics.



Photographs courtesy of Eileen Diskin

Eileen believes that her research provides a good example of how our world's biodiversity can be used to study a broad range of issues that have implications for society today.

EVENTS

Europe's largest multidisciplinary Science Conference, the 5th EuroScience Open Forum (ESOF), will gather in Dublin City from the 12th-16th of July, 2012. For more information about this event and associated scientific festivities, please visit: www.esof.eu, www.dublinscience2012.ie/.

The National Botanic Gardens will be hosting this year's IPSAM conference, from the 3rd-5th of April: For more detail visit: www.botanicgardens.ie/IPSAM2012/index.html.

The National Biodiversity Data Centre has a selection of identification and recording workshops running from February to October 2012. For more information please visit: www.biodiversityireland.ie/identifying-recording-irelands-biodiversity-2012/

Interdisciplinary postgraduate symposium showcasing some of the research currently being carried out by TCD Zoology and Botany postgraduates at on 16th-17th April, 2012.

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