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WELCOME

Welcome to the 9th issue of the PLANFORBIO Research Programme Newsletter. FORESTBIO, the first of the four projects in the programme, was completed in January 2011. This is a timely delivery of this project report, as the United Nations General Assembly declared 2011 as the International Year of Forests to raise awareness on sustainable management, conservation and sustainable development of all types of forests. This project revealed a wealth of biodiversity, not only in our native woodlands, but also in our plantation forests, and the final project report is now available.

The team have now embarked on the BIOPLAN project, where they have teamed up with Forest Research, UK to look at indicators of biodiversity across Ireland and the UK using standard survey methods where possible. The teams are looking forward to a good summer of fieldwork, particularly the Hen Harrier team, who have just started to deploy GPS tags on adult birds at their study sites.

WILD HERBIVORE IMPACT ASSESSMENT

Miles Newman

The assessment of herbivore numbers and their impacts has been approached from many angles, especially in the last decade or so. From low-tech methods of faecal counts to high-tech methods involving thermal imaging taken from aircraft, accurate population estimations have been the goal. The question remains the same however: what are the herbivore impacts compared to the population size? Is your woodland being preyed upon by a few wild herbivores repeatedly or a large group which passes by every few weeks? Does it matter?

For the purpose of management, it may be more useful to look at the past and present impacts of the wild herbivores with less emphasis on the current population size. Any culling regime needed is then based on the impact rather than the number. This type of predictive management is being developed and promoted by the Forestry Commission Scotland through their online Woodland Grazing Toolbox (<http://www.forestry.gov.uk/forestry/INFD-82TLHE>), and also through consultation and outreach with stake holders. I attended one of these consultation field-meetings in Spring this year and saw the assessment methods being tested first hand.

The assessment begins with the establishment of aims, i.e. what are you managing the woodland for? Is the woodland being managed for a rare butterfly needing high grazing or are you looking for tree regeneration as the primary objective? After setting these aims you then define your woodland type and structure. The idea behind the predictive management is that it is continuous, in the sense of continued surveys of vegetation on a set time frame and then adjustment of the herbivore population as needed.



Participants at the online Woodland Grazing Toolbox field meeting in Strontian, Argyll.

This method also incorporates the distinction of historical (more than 12 months ago) and present (within the last 12 months) grazing. Often a site may look heavily grazed with an obvious browse line in the trees and reduced holly and side shoots on branches. On closer inspection the last years green shoots may be intact and free from herbivore damage, meaning that the high pressure on the woods may have been reduced greatly in the last 12 months.

Indicators like these are very difficult to quantify, so the method uses qualitative ranges of impact to describe the site. This is still very useful if management is long term and on-going, as comparisons and alterations can be made year-to-year or season-to-season. I hope to adopt these methods on the semi-natural woodland areas we are working on in order to compare large herbivore impact between plots and sites. I would like to thank Helen Armstrong and Richard Thompson for inviting me on this workshop and for insight into deer management.



FOREST BIODIVERSITY RESEARCH IN CANADA'S BOREAL FOREST

Anne Oxbrough

In November 2009 I left the FORESTBIO research project for the University of Alberta, Canada on an EU funded IRCSET Marie Curie International Mobility Fellowship. This three year postdoctoral position involves a two year secondment in Alberta and a return year at University College Cork. This scheme gives me the opportunity to work with a leading expert in my research field, in this case Professor John Spence at the University of Alberta, as well as carrying out research in a very different environment from the one I have been used to in Ireland.

Last summer I carried out fieldwork in the mixed wood boreal forest of Northern Alberta. The aim was to examine how small-structural features of the litter layer influence invertebrate diversity. Litter-dwelling invertebrates carry out important functional roles in forest ecosystems, involved in the cycling of nutrients and the regulation of other invertebrate populations, some of which are potential pest species. As such, these groups are vital to forest ecosystem health. The invertebrates were collected using a combination of pitfall traps (a plastic cup inserted into the ground which collects surface active organisms) and litter samples. The collected litter samples were taken back to the lab where they were placed in beresele extraction funnels. These funnels extract invertebrates which live in the litter by encouraging them to move away from a light/heat source above funnel to a collection bag underneath. This extraction takes place over a three day period as the litter dries out.

Fieldwork in the boreal forest is challenging and quite different from that in Ireland, most notably because of the interesting animals which come to watch you work! Brown bears are very common, but luckily the larger and more aggressive grizzlies are scarcer. However, you can't go into the fieldwork without first completing 'bear safety' training and being armed with bear spray (pepper spray which usually stops them if they charge you). At the beginning of the field season in May many bears can be seen out along the logging roads, eating new shoots and leaves from the shrubs. I would often see 10-15 within a 20km stretch of road, which also makes you realise how many there are! Later in the season they are more likely found within the forest eating ripe berries, they can move through the forest quite quietly and are much harder to spot. Other animals I encountered in the field included moose, beavers, white tailed deer and on one occasion a lone wolf.

In addition to the wildlife, we also work in quite remote locations. The boreal forest stretches across the entire north of the continent from Alaska to Nova Scotia and is sparsely populated. In Northern Alberta, where I carried out fieldwork you could walk north for 500 miles through forest before reaching the Arctic tundra, so good navigation skills are essential! In addition, much of the forest cannot be reached by road, so quad bikes are a must for reaching the stands.

This year I am working in the lab at the University of Alberta identifying the species of invertebrates which I have collected. In particular I am focusing on two groups of predatory invertebrates, spiders and Carabid beetles; springtails, which are highly abundant in the soil and litter layers mostly eat decaying matter; and some groups of beetles from the Staphylinid family which eat fungi. By looking at these very different invertebrate groups I hope to gain insight into how their communities are structured in the litter, but also broaden my taxonomic expertise.

In November 2011 I will return to University College Cork for a year to continue research on litter dwelling invertebrates, but this time in Irish forest plantations. This work will be supervised by Professor John O'Halloran and I will also continue to collaborate with former colleagues on the PLANFORBIO programme.



Many of the experimental stands are far from the forest roads and can only be reached by quad bike.



Putting in a pitfall trap in a white spruce stand in the boreal forest.



Beresele funnel invertebrate extractors. The litter samples are placed inside and over three days the invertebrates migrate away from the light and heat of the 100 watt bulb falling into the collection bag at the bottom.



Black bears are often brown too! A common hazard of fieldwork in the boreal forest.

IFW SHOW 2011

The PLANFORBIO research team recently attended the Irish Forestry, Woodland & Bio Energy Show at Birr Castle Estate in Co. Offaly. There were over 90 exhibitors at this show demonstrating a wide range of machinery from forwarders and forestry cranes to chippers and firewood processors.



The Irish Timber Grower's Association, with support from the Forest Service, hosted a Conference & Education Centre at the show, where the PLANFORBIO team had an interactive stand highlighting Ireland's forest biodiversity and forest biodiversity research. Over the two days of the show researchers met with industry members and members of the public and provided information on research carried out on the PLANFORBIO Programme. John O'Halloran and Mark Wilson also gave lectures on forest biodiversity research and Irish forest birds during the seminar sessions on each afternoon.

In this photo: John O'Halloran, Nick McCarthy, Sandra Irwin, Rob Deady, Lauren Fuller

ANNUAL AUGUSTINE HENRY FORESTRY LECTURE

Augustine Henry (1857 – 1930) was born to an Irish family in Dundee. He was raised and educated in Ireland and was a botanical explorer and dendrologist whose career took him from Ireland to China, where he collected more than 15,000 specimens for the Kew botanical gardens in London. He subsequently studied at the National School of Forestry in France before becoming a Reader in Forestry at Cambridge from 1907 to 1913. He was involved in developing the National Forestry Service and is regarded as the 'father' of Irish commercial forestry and numerous plants are named in his honour (e.g. *Acer henryi*, *Lilium henryi* and *London Plane cv 'Augustine Henry'*).

The Royal Dublin Society organises an annual Augustine Henry Memorial Lecture which takes place each year during National Tree Week and is held in association with the Society of Irish Foresters. The 2011 Augustine Henry Lecture at the RDS, Dublin was given by Professor John O'Halloran. This lecture reviewed how our knowledge of environmental matters relating to forestry has changed over the past 20 years, how the BIOFOREST and PLANFORBIO projects have contributed to this, and outlined the challenges and opportunities currently facing the forestry and biodiversity industry in Ireland.

INTERNATIONAL SYMPOSIUM ON ECOLOGICAL FUNCTIONS AND SERVICES OF DEADWOOD IN FOREST ECOSYSTEMS

Rob Deady

Just before the start of the BIOPLAN invertebrate fieldwork season in May this year, I got the amazing opportunity to attend, and present a poster on my Diptera masters research, at the international symposium "On dynamics and ecological services of deadwood in forest ecosystems: Deadwood and dying trees, a matter of life and diversity which has a nice ring to it". The symposium took place in a small mining city called Rouyn-Noranda in South-Western Quebec, Canada. Rouyn and Noranda were each founded in the early 1900s and later merged in the late 1980s.

Altogether there were 120 participants from 20 countries which gave seminars and/or poster presentations while others just attended. The symposium consisted of 15 minute seminars that were run parallel to each other sandwiched between six keynote sessions and a late afternoon poster session with 1 minute quick fire poster communications, in which I participated. In addition, there was a mid-symposium field trip to the Lac Duparquet research station and teaching forest aimed at illustrating how forest ecology and deadwood management is conducted in the eastern boreal mixed wood expanses of forest in Quebec. Finally, there was a post-symposium excursion.

The main sponsor of this symposium was IUFRO (The International Union of Forest Research Organizations) Division 8.02.02 – Forest biodiversity and resilience. There were also a range of other collaborators and partners which can be viewed on the official website for the conference www.deadwood2011.uqat.ca/.

For pictures of the symposium, attendees, highlights and, of course, the saproxylic realm of biodiversity go to <https://picasaweb.google.com/109094305210110387386>. Thanks to Mike Ferro for documenting everything that happened at this event including the rare sighting of Mr. Beaver just outside the research station!

MEDICINES IN THE FOREST

Linda Coote



Reenadinna Yew Wood in Killarney National Park

To celebrate the 300th Anniversary of Botany in Trinity College, a Physic Garden containing over 70 species of medicinal plants was opened. Botany was originally established in Trinity to teach medical students about the medicinal properties of plants. Among the plants found in the Physic Garden are several which can be found in our woodlands. The yew tree (*Taxus baccata*), one of our few native conifer species, is the source of Taxol, which was discovered in 1967 and is used in the treatment of breast, lung and ovarian cancer. Yew woodlands are rare in Ireland and the BIOPLAN team will be studying the biodiversity of one of these woods, Reenadinna wood on the Muckross peninsula, Killarney, this summer. Another native tree species, the willow (*Salix spp.*), is the source of Aspirin, which is one of the most commonly used drugs in the world. Aspirin is synthesised from salicylic acid, which is found in willow bark. As well as the woodland trees, some of the flowering woodland plants also contain medicinal products. Foxglove (*Digitalis purpurea*) is one of the most important plants used in the treatment of coronary heart disease and St. John's Wort (*Hypericum spp.*) acts as a mild anti-depressant and is approved for treatment of muscle pain. However, St. John's Wort can also decrease the effectiveness of other medications and can cause sensitivity to sun exposure. So next time you're down in the woods you might look at some of the plants in a different light. But remember, most plants are poisonous, we have just found ways of using the poisons to our advantage!



Saproxylic bracket fungi (conks or fruiting bodies) growing on a low snag. The spores are released from the underside of the fruiting body. Photo taken on the mid-symposium field excursion at the Lac Duparquet teaching forest.



Some of the deadwoodology students pictured at Lac Duparquet. Standing from left to right: M. Ferro, A. Leduc, S. Olajuyigbe and R. Deady. Crouching from Left to Right: J.B. Lambert, T. Inoue and S. Naito. Photo taken by Mike Ferro.

PLANFORBIO STUDENT WINS BEST FORESTRY PRIZE AT ENVIRON 2011

BIOPLAN Post-graduate students Lauren Fuller and Rob Deady each presented their research at the recent ENVIRON 2011 Colloquium at UCC. The theme of the 2011 colloquium was "Towards 2020: Environmental challenges and opportunities for the next decade." The 2020 date reflects the many environmental targets that have been set for the next decade, particularly in the area of climate change. In excess of 300 delegates, from a diverse range of disciplines, attended this conference.

Lauren's poster 'Can roads be used to enhance forest biodiversity?' included information on the research that she is conducting towards her PhD at UCC. Also at Environ 2011 Rob Deady won "Best Forestry Poster Presentation" (sponsored by COFORD) for his poster 'What dipterid diversity does thinning debris and clearfell debris support in Irish plantations'. This poster outlined Rob's MSC research on forest deadwood and how it is a very important resource for a wide range of organisms including birds, fungi, plants, mosses and, in particular, insects. While larger diameter deadwood is typically in short supply in Irish plantations (except in the form of stumps) there is an abundance of fine woody debris due to various ongoing forestry operations. Rob has examined clearfell and thinning debris (brush) in Irish plantations in order to determine the diversity and fraction of specific Diptera (true flies) that are deadwood reliant.



Dr Shirley Gallagher, Chairperson of the Environmental Sciences Association of Ireland, presents Rob Deady with his prize for Best Forestry Poster at Environ 2011.

EXPANDING AN IMPORTANT COLLECTION – THE TCD HERBARIUM

Anke Dietzsch

While out on field work over the summers, the PLANFORBIO team collected many plant specimens. This has not only helped to identify the species and provided back up for our Irish biodiversity database but also left the team with valuable dried plant material to be added to the plant collection at the Trinity College Dublin herbarium.

Herbaria have become important international research tools because of the ongoing changes to our environment. A herbarium is, essentially, a preserved reference collection of plants and for this reason is irreplaceable. Like an ancient library you cannot retrieve any material if you lose it. Some of a herbarium's main functions are to allow identification of plants, to certify correctness of plant names, to act as a source of information on plant distribution and ecology, to support research and teaching, and to provide a source of material for plant taxonomists.

The Trinity College Dublin herbarium is one of the three substantial herbaria in Ireland. The National Botanic Gardens, Glasnevin, and Ulster Museum, Belfast, also host collections. Established in 1840, the TCD herbarium is really the creation of its second curator William H. Harvey who had accumulated 100,000 specimens by the mid 19th century. Today, the herbarium holds 300,000 specimens in its collection and is essential for various research projects carried out at TCD. It encompasses many different plant groups, including algae, mosses, lichens and liverworts, ferns, conifers and flowering plants. Its Irish holdings are a significant part of our Irish heritage. The hundreds of type specimens held there and the non-Irish material from all regions of the world, including Antarctica, make it an important resource on a world scale.

If you want to find out more, visit <http://www.tcd.ie/Botany/herbarium/>

IUFRO 2012 in association with the Department of Agriculture, Fisheries and Food

2nd International Conference on Biodiversity in forest ecosystems and landscapes
University College Cork, Ireland
28-31 August 2012

First announcement and call for Symposia
Proposals for symposia should be submitted to s.irwin@ucc.ie by August 31st 2011.
Call for abstracts opening October 2011

This conference will provide an international forum for researchers, practitioners and students to discuss the challenges of maintaining and enhancing biodiversity in forests, and consider emerging trends in the sustainable management of forest ecosystems and landscapes.

 www.ucc.ie/en/iufro2012

CONGRATULATIONS

to Rebecca Martin who was awarded her PhD in March.

Rebecca has recently taken up a post in New Plymouth on the north island of New Zealand as the Terrestrial Biodiversity & Conservation Officer for Taranaki Regional Council.

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