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## WELCOME

In April of this year, the BIOPLAN research project got underway at UCC and TCD. Recruitment of all staff associated with BIOPLAN has been completed and we are delighted to welcome a number of new faces to PLANFORBIO. All researchers are currently in the midst of the busy field season which involves re-surveying the established sites of previous projects coupled with a selection of new Level 1 long-term monitoring plots.

The fourth season of intensive HEN HARRIER research is underway. The continued support of the NPWS on this project allows us the critical manpower to coincide maximal survey data collection with GPS deployment on adult Hen Harriers. The unique opportunity to re-employ our seasonal fieldworkers is already yielding benefits to this study in terms of an established suite of surveyor skills and consistent researcher effort.

Exciting progress on the RHODO project at Waterford Institute of Technology has isolated a fungal pathogen of Rhododendron from an Irish location and at present, laboratory trials are being conducted to compare the virulence of this isolate to English and Finnish varieties for effective Rhododendron control

## BIOPLAN INVERTEBRATE SURVEYS

Lauren Fuller

During the last three months Lauren Fuller and Rob Deady have been pitfall trapping and malaise net trapping in earnest to collect samples for the BIOPLAN project. Incorporating a range of forest types the focus of the trapping is on spiders, hoverflies and carabids as biodiversity indicators in three different research projects. These three taxa are often used as biodiversity indicators as they are easy to catch, taxonomically well-known and respond to a range of environmental changes.

The first project re-surveys eight second-rotation sitka spruce experimental plots set up in the BIOFOREST project in 2005. A "standard" roadwidth of 15 metres and a "wide" roadwidth of 30 metres were established in each of the eight sites. In 2005 the trees were too small to influence biodiversity of the road verges. But now, five years on, we are carrying out the same sampling in these sites to provide a chronosequence of information that can be developed through the forest cycle. It is expected that as the trees mature they will have more of an effect on the biodiversity of the road verges and the roadwidth treatments will start to have an impact.

The second project builds upon work done in 2002 for BIOFOREST which assessed the biodiversity of invertebrates within one year of afforestation in five grassland sites. These sites have been afforested with a variety of broadleaf and coniferous trees and now, eight years later, we are using the same trapping protocols to provide a direct assessment of change in biodiversity through the forest cycle. Comparisons will be made between the years and also between the effect of "standard" open space plots and "supplementary" linear plots which sample additional features such as hedgerows and streams.

The third project is new and we are hoping to expand it to include more sites in 2011. This year we have set up long-term monitoring plots in five mature coniferous sites in Coillte managed forests, using the same sampling protocol as FORESTBIO. These forests have already been subject to detailed research as part of the FutMon pan-European project which constantly assesses forest health. This collaboration will allow us to periodically assess invertebrate biodiversity and add to information already being gathered.



Malaise trap set on the forest edge at one of our long-term monitoring sites in Cork. These traps are being used to collect hoverflies, but there is evidence they can also be used to catch spiders



A transect of pitfall traps along a hedgerow and a stream at a tracking site in Donegal. These linear features are "supplementary". Each trap is marked by a cane with red tape at the top.

Identification of invertebrates will start in September this year and we look forward to reporting the results.



## BALANCING A JOB AND PHD RESEARCH



*Barry works on his PhD at a computer after a full day rangers*

*Barry O'Donoghue*

Every day I feel privileged to be working in the job I always wanted since I was very young, a Ranger with the National Parks and Wildlife Service, and in addition to this, being in the select position of conducting research towards the future conservation of my favourite piece of Irish wildlife, the magnificent but endangered Hen Harrier. However, balancing the two, moreover fitting the two into 24 hours, is not always easy. I am not the first person to have done this, nor the last. This short note is intended as an insight/advice/health warning! to those considering this double

life of employment and PhD research.

As I start into this critique, I note the time on my screen here says 01.22 and I was on the road this morning for 07.00. First thing today, I went to my office in Killarney National Park, overlooking Ross Castle, Lough Leane and the McGillicuddy Reeks. After processing the paperwork, including NPWS Farm Plans, Local Authority queries, Forest Service queries and hunting licence applications, I headed for a meeting with RTÉ on Mullaghanish Mountain, on the Cork-Kerry border. RTÉ own the top of Mullaghanish, and are currently erecting a new 220m high digital TV and telecommunications mast. The bog is protected as a Special Area of Conservation (SAC), and it is imperative that the large scale works associated with such a structure do not adversely impact on the blanket bog. After lengthy discussions, I headed for the wilds of the Derrynasaggart Mountains, to survey a house for rare bats. From there, I cut across the mountains to the Gearagh just outside Macroom, Co Cork. A farmer has started into some land claim works in a field on the boundary of the SAC there, and I talked to him about this, and a large area of high quality alluvial woodland was thereby saved. Next stop was Carrigadrohid Dam to inspect an aquaculture licence from the ESB for salmon rearing. I then travelled to the Boggeragh Mountains to monitor the Natural Heritage Area blanket bogs and the Hen Harrier Special Protection Area. From there I went to Newmarket to meet a man about the River Blackwater SAC, from where he wants to extract gravel. Then I went to North Kerry to carry out a Hen Harrier winter roost watch as part of the Irish Hen Harrier Winter Survey (IHHWS) which I co-ordinate. Then home to eat the dinner and look at emails which included formulating an in-depth feed into national policy regarding Hen Harriers and replying to 20 emails from IHHWS participants. Then I began to work on my PhD. Anyone who is doing or has done a PhD will tell you how demanding it is, and trying to complete it from 8.30pm onwards is a difficult task. Thankfully, the field research of the last two years collected large amounts of data and now it's down to analysing it all and writing it up, and I still have a great thirst for the study.

I was very fortunate in the support that I received from NPWS to allow me time to conduct research for my PhD, but even so, for anyone considering doing a PhD while working, make sure you are doing it for the right reason – that you have a passion for the study subject. Do not start into a PhD for a few letters attached to your name – either the job or the research will drop along the way if that is your motive. Become super-efficient at what you do. Don't forget there is life outside of work and the PhD. Enjoy it and remember the privileged position you are in. Best of luck!

# FOREST RESEARCH TRANSLATES INTO ACTION

*Maria O'Mahoney*

A recent workshop translating research output of the PLANFORBIO research programme which was held at the Environmental Research Institute, UCC on the 31st March showed huge potential for opportunities to support biodiversity as well as sustaining Ireland's important forest industry. Over forty people representing academe, industry and policy makers attended the translation workshop whereby research collected by the PLANFORBIO research team were translated into potential actions which the industry could use to sustain the forest industry and maintain biodiversity. Professor John O'Halloran, the research program director, said 'the focus of this meeting was to translate research into action through consultation with, and participation by, forest practitioners'. 'Our COFORD funded research program is mid-way through its 6 year cycle, and this workshop provides a great opportunity to translate some of our findings and shape the next projects'. Contributors to the event included UCC and TCD researchers, Coillte Teoranta and Forest Service specialists.



*Participants at the translational workshop for PLANFORBIO*

The research knowledge gained through a series of COFORD-funded, multidisciplinary research projects, undertaken since 2001, has provided considerable expertise on existing forest biodiversity in plantation forests and native, semi-natural woodlands in Ireland. Relating forest biodiversity to current management practises has been pivotal in the interpretation of existing biodiversity data relating to plants, invertebrates and birds both on the ground and in the canopy, from 1st rotation and 2nd rotation plantations. To this end, management recommendations for future biodiversity conservation were a key deliverable from this research, John O'Halloran told participants. The importance of utilising research input in the development of forest management policy was highlighted and throughout the day, researchers and practitioners engaged in considerable discussion about forest management and biodiversity goals. A field excursion to Garrynagree, Co. Waterford which a Norway Spruce/Oak mix plantation forest provided considerable scope to discuss the wider practical implications of forest management policy in existing plantation forests. The ultimate outcome of the PLANFORBIO research translation day was established through a connection forged between biodiversity goals and forest management objectives and resolving that these priorities should be all-inclusive within future forest management policy guidelines.



# TRANSFER OF KNOWLEDGE TRIP TO FINLAND

Eddie Daly

During the first week of September '09 Eddie Daly, PhD student on the PLANFORBIO RHODO project, from WIT visited Finland on a short term scientific mission. His assignment was to observe the METLA (Finnish Forestry Research Institute) crew as they put the finishing touches to their research project on controlling sprouting in birch trees using *Chondrostereum purpureum*.

Finland is a relatively new country (republic) and its history mirrors much of our own. It was controlled by the Swedish from the 13th century to the 18th only for the Russians to seize the land until Finland elected its first president in 1919. Industrialisation came late to Finland; it remained a largely agrarian country until the 1950s. However since then Finland has frequently topped many international comparisons of national performance.

METLA is situated in Vantaa, a small town 10k or so north of Helsinki. It was established in 1917 to support Europe's most forested country and has become Europe's biggest forestry research institute. Lauri Relander, the second president of Finland, lived there during the institute's formative years. The building he and his family resided in now houses the institute's library. He himself was a forester with a PhD in agriculture.

Eddie had the opportunity to experience both lab work and field work during his visit. He participated in a visit to state owner forests that contained land under power lines where birch regeneration was causing problems. In Finland the need to control pioneering broadleaf species is significant. The trees compete vigorously with the more valuable coniferous species over light, water, nutrients and space. They have set up an experiment to investigate the efficiency of *Chondrostereum purpureum* to control regeneration. The site that Eddie visited was 20km from the labs, had very high success rate. Almost 90% of stumps were infected after the second year of the experiment. The team at WIT would be very happy to attain such a high success rate against Rhododendron! Eddie also spent time collecting samples of the fungus for analysis in the lab from a site that had had the fungus introduced four months previously. He found it surprising how virulent the fungus is in an experimental setting. All in all this was a very useful journey, highlighting the importance of communication between research groups in different jurisdictions. The trailblazing work of the Finnish team, and their willingness to share their experiences and information, should save us many a heartache and some precious time for the team at WIT.

## SAPROXYLIC INSECTS – A CONSERVATION PRIORITY

Rob Deady & Lauren Fuller

In the past, Ireland was swathed in native (often ancient) forest cover. Today the ~1% of native forest cover, (amounting to ~10% total forest cover if one includes non-native coniferous plantation cover) is the lowest percentage cover in the European Union (EU) which averages about 30%.



Two mating Longhorn beetles, *Rhagium bifasciatum*. These rely on dead wood, (mainly coniferous trees) in which they lay their eggs after excavating large galleries.

Within Ireland's current forest estate, there reside many organisms that are in need of conservation; however, it is thought that saproxylic insects in particular require special and prompt attention due to their intimate relationship with forestry management in the context that they use logging and thinning

debris as ovipositing sites. Saproxylic insects are those insects that depend on decaying wood at some stage of their lifecycle and are an important functional group. The word "saproxylic" probably originated from the Greek word "sapos" meaning rotten and "xylon", wood.

Previous work conducted by Dr Oisín Sweeney with the PLANFORBIO research programme highlighted a shortage of large diameter deadwood (Sweeney et al. 2010), which the majority of our saproxylic insects, particularly species of conservation concern, would be reliant on. This research identified that the volume of logs in Irish plantations is about 50% less than that in native Irish forests.

Large diameter deadwood or coarse woody debris (CWD) is, by definition, any piece of deadwood that is above 10cm. Whilst CWD has been identified as an important habitat component for saproxylic insects, fine woody debris (FWD) or "brash" (everything that is 10cm or less) has received little research attention in terms of quantifying its importance for this functional group.

As such, Rob Deady and Lauren Fuller are investigating the ecological significance of FWD for saproxylic insects as part of the BIOPLAN research project. At several BIOPLAN field sites, emergence traps have been deployed to identify insect species that utilise brash during their lifecycle and brash-line pitfall traps will be used to identify particular ground-dwelling insects that utilise FWD micro-habitats for other purposes, e.g. refugia. Concurrent to these field surveys, varying diameter deadwood samples have been re-housed in cotton sacks at UCC and maintained in temperature controlled conditions such that saproxylic insects will be reared out.

## ASSESSING THE EFFECTS OF LARGE HERBIVORE GRAZING ON FOREST BIODIVERSITY

Maria O'Mahoney & Miles Newman

In general, large herbivore grazing extremes predominate in Irish forests. Wooded areas such as National Parks and Nature Reserves tend to be exposed to high grazing pressure whilst contrastingly low grazing pressure is often evident in plantation forests and privately owned woods. Both extremes have been shown to have a negative effect on forest biodiversity.

A new study will be undertaken as part of the BIOPLAN research project which aims to determine an appropriate management strategy for large herbivores

with a view to optimising forest biodiversity in the face of grazing pressure. For the current field season, the impact of different levels of large herbivore grazing on the ground flora diversity and tree regeneration in Irish semi-natural woodlands will be investigated. This study will be carried out using a series of existing long-term experimental exclosures and controls dating back to the late 1960's at locations in Killarney National Park and Wicklow Mountains National Park, and ranging in size from 0.04ha. to 1.2ha. The overall aim of this study



Ungrazed (top picture) and grazed (bottom picture) Hard Fern, *Blechnum spicant*.

is to identify particular forest associated species that correspond to particular levels of grazing. Such information will be used to establish a suite of indicator species that can be used to inform forest management recommendations. An additional output of the proposed research involves outlining the sustainable grazer carrying capacity for forest ecosystems.

## NEW FACES

We are delighted to welcome a number of new people to the PLANFORBIO team this summer. Lauren Fuller, Miles Newman, Rob Deady, Aisling Walsh and Dr Anke Dietsch have all joined the BIOPLAN research project which kicked off in April. Both Lauren and Miles are PhD students with BIOPLAN; Lauren is investigating forest invertebrate diversity and Miles is assessing the impacts of grazing on forest biodiversity. Rob is conducting an MSc research project on forest invertebrate assemblages and both Aisling and Anke are research assistants associated with the project.

Paul Troake and Barry Ryan have re-joined the HEN HARRIER project for the summer to assist with fieldwork. They will be looking for Hen Harrier nests through the early part of the breeding season, and then gathering data on breeding success at these nests in the later stages. They will also be involved in data collection using GPS tagging, nest cameras and wing tagging of young chicks later in the season.

Dr Tom Gittings, an avian and entomological expert, joined the BIOPLAN research group as a temporary staff member to conduct bird surveys from April to July. Tom has also made significant contributions in mentoring both Lauren Fuller and Rob Deady to ensure a timely and efficient start to the current field season for these new recruits.

## CONGRATULATIONS

Congratulations to Oisín Sweeney who was recently conferred with a PhD at University College Cork for a thesis entitled "Bird assemblages of native woodlands and non-native plantations in Ireland" conducted with the FORESTBIO project. Oisín has recently moved to Australia and we wish him the very best of luck for the future.

## RECENT PUBLICATIONS

Sweeney, O.F.McD., Wilson, M.W., Irwin, S., Kelly, T.C. and O'Halloran, J. 2010. Are bird density, species richness and community structure similar between native woodlands and non-native plantations in an area with a generalist bird fauna? *Biodiversity and Conservation*, 19: 2329-2342.

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Sweeney, O.F.McD., Martin, R.D., Irwin, S., Kelly, T.C., O'Halloran, J., Wilson, M.W. & McEvoy, P.M. 2010. A lack of large-diameter logs and snags characterises dead wood patterns in Irish forests. *Forest Ecology and Management*, 259: 2056-2064.

## PROJECT PARTNERS

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PI: Dr. Daniel Kelly

**Waterford Institute of Technology**  
PI: Dr. Nick McCarthy

**Coillte**  
PI: Mr. Mick Keane



Barry O'Mahony holding a male Hen Harrier after tag deployment

## HEN HARRIER TAGGING SUCCESS!

Mark Wilson

Up until now, most data on habitat use by foraging Hen Harriers has been collected through direct watches. This is relatively inefficient (a full day of watching typically yields no more than a few minutes of foraging observations), prone to bias due to certain areas being easier to watch than others, and does not generally allow observations of foraging birds to be associated with their nest. Remote tracking has the potential to overcome all of these problems, but of all the available technologies for remotely tracking wildlife, only GPS is sufficiently accurate to distinguish between different habitats in the 'fine-grained' landscapes occupied by breeding Hen Harriers. GPS is an archival technology, which means that the positional information it collects is stored on the unit itself. Some GPS tags allow researchers to retrieve this information remotely, by remotely communicating with the tag via satellite or radio signal, but these are too heavy to be used on Hen Harriers. In collaboration with GPS developers in Rome, we designed a tailor-made GPS system for tracking foraging Hen Harriers, which we have been testing and improving for the past two years. In 2010 we made breakthroughs on several fronts, and our system has now been used successfully, with four adult birds (three males and one female) captured and tagged.



Dho gaza net with Red Fox decoy for Hen Harrier capture

In order to improve our chances of capturing birds we could fit with GPS harnesses, we made several changes to our capture protocols. Our stalwart decoy of the past two years, a stuffed Eagle Owl, made way for a Red Fox, a native predator of Hen Harrier nests, and the species which has been most frequently implicated in predation in our population. We changed the nets we were using from standard mist nets to a collapsible dho gaza net, which is designed specifically for catching larger birds in situations where one bird is

being targeted. Probably the most important change we made was in the seasonal timing of our trapping attempts. By only trapping at nests where we had deployed cameras, we were able to ensure that trapping attempts of males only took place within 1 week of hatching, and trapping attempts of females only when chicks were old enough that they required little or no brooding. This maximised our chances of getting a favourable response to the decoy from the target bird, to the extent that all four captures were achieved without the use of audio playback.

The response of Hen Harriers to capture and tagging was very encouraging. All four birds took some hours to adjust to their harnesses and the stress of being captured, but all were observed bringing food to their nests the next day. Furthermore, the level of success at these nests was relatively high, two of them fledging four chicks in a relatively poor year for breeding Hen Harriers (only one other nest found by us successfully fledged as many chicks). One of the nests suffered partial failure, with two of the three chicks disappearing, but this was thought to be due to a predation attempt rather than to reduced provisioning by the male.

All four tags detached after a weak link in the harness broke, as they are designed to do, and without creating a difficulty for the birds. This being the first deployment of our harness design in the field, the successful detachment is great news. Unfortunately, the first two of the tags we deployed were prematurely removed by their wearers breaking an exposed portion of the weak link. We retrieved both of these tags, but unfortunately the deployment periods were too short to yield useful foraging data. However, we addressed this problem by encasing the weak link in shrink tubing, and the next two tags remained attached for several weeks until the weak link broke of its own accord. As this article is written, efforts to locate one of these are ongoing, but the other has been retrieved, and over 16,000 locations comprising four full days of foraging data have been downloaded from it.

Overall, then, although we've experienced a few setbacks, we've learned from these and have proven that our system for collecting GPS data from Hen Harriers works, boding well for next year's field season!

## FOR FURTHER INFORMATION

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