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## WELCOME

The first in the series of projects on the PLANFORBIO Programme, FORESTBIO, is now drawing to a close. All research has been completed, and PhD students and post-docs are busy analysing data and preparing findings for peer-reviewed publication. This project has included the first comprehensive biodiversity surveys of native plantations and mixed woodlands in the Irish landscape.

A new project, the fourth in the series, BIOPLAN, will get underway in early 2010 and will build on the research of FORESTBIO, as well as the earlier BIOFOREST project. The information gathered during these projects will be combined, to allow assessment of forest biodiversity at a landscape level. It will also establish links with Forest Research (UK) and establish a framework for future forest biodiversity research in Ireland to underpin a sustainable forest industry. This exciting new project will run until 2012, and recruitment of suitably qualified staff is now underway.

The HEN HARRIER project has reached the end of its third year of intensive field research, and some very interesting findings are beginning to emerge, which will continue to be tested in coming years.

## RARE AND INTERESTING PLANT SPECIES

*Linda Cooté*

Since the last issue, all ground-dwelling plant identifications have been completed so we now have a definitive list of the plants that occurred at each of our sites. As well as a large number of quite well known and common species, some rare and interesting plants were also found. Following on from the confirmation of *Sphagnum girgensohnii* (Girgensohn's bog moss), a bog moss new to Co. Offaly, from Sheksin Sitka spruce plantation, we were delighted when leading willow expert, Desmond Meikle, confirmed a willow hybrid, *Salix x pontederiana*, which has never been recorded in Ireland before. This is a cross between the grey willow/common sally (*Salix cinerea*) and purple osier willow (*Salix purpurea*) and was found in Glengort Sitka spruce plantation near Abbeyfeale in Co. Limerick. Purple osier willow is often planted for osiers for basket making.

Also found in the same plantation on some dead wood was the moss, *Daltonia splachnoides* (Irish Daltonia). This species has a 'hyperoceanic' distribution in Europe, where it is known only from Ireland, western Scotland, Madeira and the Azores. It was classified as 'Vulnerable' in the Red Data Book of British Mosses and Liverworts. However, a number of recent findings in or near conifer plantations mean that its classification will probably be 'Near Threatened' in the soon to be published Irish

version of the book. Usually a species that is found near streams and in very humid areas, *Daltonia* seems to be exploiting the relatively new habitat of conifer plantations which meet its humidity requirements, at least in the more humid southwest of the country. Another moss which may also be exploiting the new habitat of conifer plantations is *Plagiothecium laetum* (bright silk-moss), which was found in Fauna Sitka spruce plantation in Co. Wicklow. This species has only been recorded a few times before in Ireland and at least two of these records were also from Sitka spruce plantations.



As with *Daltonia*, it is likely to appear in the new Irish Red Data Book.

*Plagiothecium laetum*

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*Daltonia splachnoides* on conifer stump  
Photo by Sam Bosanquet

We were quite surprised that all of these rare species came from plantations rather than from our Native woodland study sites. However, all of the species mentioned above, other than *Plagiothecium laetum*, have only a low or moderate association with wooded habitats. The benefit of the Native woods lies in providing habitat for a large number of species found almost solely in woodland, which is a relatively rare habitat in Ireland. Our aim is to use the findings from our work to make recommendations for policy and practice to improve the quality of plantations for a wide diversity of woodland species.



## USE OF FORESTED LANDSCAPES BY HEN HARRIERS

*Sandra Irwin*

The Hen Harrier is a good example of a bird species that can be protected through appropriate habitat management both within and outside the forest estate. Over recent centuries a number of raptor species have been lost from the island of Ireland, and the Hen Harrier, one of our rarest birds of prey, is now classed as vulnerable here and at a European scale. Ireland is required under European law to designate areas of land that will be managed for the conservation of this bird, and so we need a detailed understanding of its biology and how it interacts with habitats both locally and at a landscape scale. The Hen Harrier project at UCC is a six year project aimed at gathering appropriate information from four study areas in Ireland.

The traditional breeding habitat of Hen Harriers in Ireland is open moorland, bog and rough pasture in the uplands. Habitat loss and degradation has long been considered a significant contributing factor in the decline of Hen Harrier populations, an effect mediated through its effect on food availability. Researchers at UCC have found that Hen Harriers here have adapted to the recent increase in afforestation by nesting in Ireland's newly forested landscapes. In this context open, pre-thicket plantation forest is selected more often than any other available habitat for nesting by Hen Harriers, including closed canopy plantations, improved grassland, peatland habitats and rough pasture. Interestingly, selection for early reforestation plantations is even stronger than for first rotation plantations. This

represents an interesting difference between Irish Hen Harriers and other populations studied to date, and enables land managers and legislators to more effectively take into account the contribution made by forests in providing suitable habitats for breeding Hen Harriers.

This incidence of Hen Harriers nesting in Ireland's newly forested landscapes does not guarantee their persistence in these areas, and researchers at UCC are examining the relationship between breeding habitat and breeding success of Hen Harriers. The most productive sites studied in Ireland in recent years are producing enough juveniles each year for the number of breeding pairs to increase slowly, but it is likely that the least productive sites are barely capable of

remaining stable in terms of numbers of individuals. Research to date has found no relationship between either total forest cover or closed canopy forest cover and any measure of breeding success. However, pre-thicket second rotation forest cover has been negatively related to nest success, both at the nest site and at a 2 km scale. Research is ongoing to determine whether these observed relationships are causal, and why they vary from one area to another. A number of possibilities are being considered, including reduced time to canopy closure, increased risk of disturbance and persecution, increased predation. Completion of work by seasonal staff means that we say good-bye and a very big thanks to Barry O'Mahony, Paul Troake and Barry Ryan.



*Newly hatched Hen Harrier in active nest.*

## SPIDERS AND BEETLES IN OUR PLANTATION FOREST

*Anne Oxbrough*

Invertebrates are an important part of the biodiversity in both plantation forests and native woodlands. They act as decomposers and pollinators, and play a variety of roles in the food web from herbivores to predators and prey. Spiders and Carabid beetles are often used in biodiversity assessments as they can be easily captured using pitfall traps, are taxonomically well known and respond to changes in habitat structure. As part of the FORESTBIO project Anne Oxbrough has examined spiders and Carabid beetles in second rotation Sitka spruce plantations at different stages of the forest cycle (5 yrs, 8-12 yrs, 20-30yrs, 35-50yrs), and compared the spiders captured in these second rotation forests with those from first rotation stands of the earlier BIOFOREST project.

Spider and beetle diversity was related to stand structure in second rotation stands where the number of forest-associated species increased as the forests matured. The number of different species of spider found was related to the amount of field layer vegetation and generally declined as the forests matured. By contrast, beetle richness increased and became more specialised over the forest cycle, which may be related to slower colonisation of disturbed areas by beetles in comparison with

spiders, and a lack of open specialists at the early stages in second rotation.

Spider communities were different in afforestation and reforestation sites, which may be related to differences in habitat conditions in the second rotation such as dryer soils, lower pH, differing vegetation complexity and presence of brash. Just a few of the forest species found during the first rotation were retained in the subsequent rotation, and the early stages of second rotation forest cycle was characterised by generalist spiders. As the forests matured the spider communities between rotations became more similar. Current forest policy in Ireland supports leaving over-mature trees, and creating a mosaic of different aged stands, within a plantation. Such measures will help provide refuge for forest species after clearfell. However, in Ireland, where forest fragments exist in a landscape dominated by agriculture, particular consideration should be given to the capacity of mature forest adjacent to felled stands to support forest species, and to the configuration of over-mature areas left after felling.

## OBSERVATIONS OF A HEN HARRIER FIELDWORKER

Barry Ryan

**“All animals are equal, but some animals are more equal than others.” While all biologists know that they shouldn't show favouritism, nevertheless we're only human and it's inevitable that some species are elevated and celebrated. For many Irish ornithologists, the Hen Harrier must surely be near the top of their list. Few other species could score so highly on each of the criteria with which we all judge birds, even subconsciously. Beautiful, charismatic and evocative of wild places. For me, a landscape is only completed by the presence of an apex predator - wolves in Yellowstone, Polar bear in the Arctic, Hen Harrier over an open moorland. Without these pivotal species, the landscape ecology is missing a vital element, like a backing group without a lead singer. Long Mountain in the middle of the Ballyhouras is a magical place. There are several rocky outcrops which loom out of the heather expanses. To look down on harriers hunting here, gliding effortlessly over their territory, until your arms start to get sore from holding the binoculars so long, is a sublime experience.**

The formal description for my job as Field Assistant was to observe the birds with the goal of locating the nest sites. While obviously not everyone's cup of tea, sitting quietly in one spot in nature can never be monotonous or boring. When in the often beautiful landscape of the Slieve Aughties or Ballyhouras, there is always something of interest to see or listen to, and there is expectant drama in the air as one stays alert to the sudden appearance of either a Hen Harrier or any of a myriad of supporting characters. When these include displaying and calling Curlew at their breeding site, displaying Snipe, Grouse, argumentative Buzzards, Whitethroats singing so close it's delightfully deafening, shy Cuckoos, sauntering Pine Martens, gambolling Stoats, Green Hairstreak butterflies, mating damselflies, and a host of other creatures large and small, there isn't much time to become bored.

There are several outstanding memories from my time working in the field on this project. While sitting motionless in a wet, rushy field overlooking Caroline Mountain in the Ballyhouras, the weather calm, overcast, a male Hen Harrier appeared from the valley below. Gliding silently just a few feet above the rushes, he remained so intent on hunting, with his eyes and ears alert for the slightest sign of prey, that he was oblivious to my presence as he flew closer and closer, until he was about 25m away, before spotting me and veering off. Up until that moment my heart was in my mouth, watching a relaxed, wild harrier hunting only 25m away through 8x binoculars, so it was as if he was right in front of me, his wild beauty breathtaking from his yellow eyes

to the subtle gradation of his silver-grey colours. This was one of the most incredible wildlife encounters I've ever had.

Other highly-memorable sights include: regularly watching the adult birds' spectacular 'sky-dancing' display as if on an invisible rollercoaster in the sky; seeing birds mating; witnessing a pair of harriers sparring with a buzzard and then immediately sky-dancing as if celebrating their victory; watching adult females encouraging the juveniles to fly by not releasing the prey they're carrying; viewing the extraordinary footage gathered by the nest cameras, which demonstrates the attentiveness of the female in protecting and feeding the chicks.

I learnt a lot about Hen Harrier ecology during this appointment, perhaps most importantly about how vulnerable they are as a breeding species on this island, what a terrible loss their extinction here would be, and therefore the importance of research leading to practical conservation strategies. I certainly came away with a full appreciation of field-based research, its small (and large!) frustrations, how time-consuming it can be to make small steps of progress, and how harriers, despite being a big 'obvious' bird, can guard the secrets of their lives, and constantly throw us a 'curveball' just as we think we have them figured out.

## IRISH PLANTATION FORESTS INTO THE FUTURE: PROVIDING MORE BIODIVERSITY ORIENTATED FOREST HABITATS

Oisín Sweeney

**Currently, Irish woodlands are very different from those of our mainland European neighbours. A long history of gradual deforestation has left Ireland almost devoid of native woodland cover, and coniferous plantations are the most prevalent woodland habitat in the country. This is in contrast to mainland Europe where plantations comprise a small proportion of the total forest estate. The prevalence of plantations in Ireland has implications for the flora and fauna that inhabit Irish woodlands, as plantations are more intensively managed than native woodlands.**

One consequence of current management techniques in Irish plantations, which involve the clearfelling and replanting of whole stands, is that these woodlands do not develop old-growth features. Examples of old-growth features are large, over-mature trees, tree cavities, large dead logs and standing dead trees. The importance of old-growth features in woodlands is well documented throughout the world: veteran trees are home to a plethora of flora and fauna including birds, beetles and epiphytic mosses and lichens. The importance of dead wood far outweighs its unglamorous appearance as it not only affects nutrient cycling, hydraulics and plant germination, but provides food and breeding grounds for a huge number of insects, which in turn provide food for birds and mammals. It is for these reasons that the remnants of old-growth, primeval forests that are found in eastern Europe are some of the most important woodland habitats on the continent.

The challenge for Irish foresters in future decades, in light of the growing realisation that plantations must provide more than just timber, is to design and plan plantations to mimic as closely as possible more natural forests, and the Forest Biodiversity Guidelines provide a good framework for achieving this goal. It will require that we move towards a system where continuous cover forests (the felling of small areas within larger patches of forest) become more common, as they are in mainland Europe. Continuous cover provides a constant woodland habitat and helps to ensure that the plant and animal species that colonise woodlands when the trees are present are not made extinct as a result of clearfelling. In addition to continuous cover, a number of individual trees should be excluded from harvesting completely and left to senesce. This would allow such trees to develop old-growth features and to deposit large amounts of dead wood, which will be of long-term benefit to biodiversity.

# 2nd European Congress on Conservation Biology

Rebecca Martin

In September, two members of the PLANFORBIO team attended the 2nd European Congress of Conservation Biology (ECCB) at the Czech University of Life Sciences in Prague. The ECCB is a prestigious international forum for researchers involved in research related to conservation biology and/or ecology. Rebecca Martin and Oisín Sweeney both gave oral presentations on elements of their PhD research. Rebecca Martin described some results on the biodiversity of canopy arthropods in mixed and pure plantation forests, while Oisín Sweeney's presentation was concerned with bird density and species richness in native and plantation woodlands in Ireland.



There were numerous symposia and presentation sessions on a wide variety of topics, including Forest Ecology and Management, Biodiversity Monitoring, Climate Change, and Landscape Ecology and Management. Feedback on Rebecca and Oisín's presentations, and the work being done by the PLANFORBIO team, was very positive, and it was an excellent opportunity to set their own research in a national, European and global context by learning about other projects in this area and meeting with many international researchers conducting similar work.

The conference was attended by over 1200 conservation biologists from 64 countries, including representatives from many international Universities, EU staff and researchers involved in conservation issues, state-funded conservation agencies, environmental research groups, and NGO's, among others, many of whom made presentations on their current research projects. Plenary speakers at the conference included the Czech Minister for the Environment Ladislav Miko, and well-known conservation biologist William Sutherland.

## Congratulations

**Congratulations to John O'Halloran** who was recently awarded a DSc by the National University of Ireland for his substantial and sustained contribution to research over the past 25 years.

**Congratulations also to Treemetrics**, the industry partner on the EPA funded LASERSCAN project, who recently won the IBM SmartCamp competition. This is an exclusive networking and mentoring event for entrepreneurs and provides access to world-class advisors plus a direct route to seed and venture capital. Treemetrics will receive a three month mentorship program with IBM to help them build an 'investor ready' proposition, and a 25,000 award from the National Digital Research Centre.

**Best of luck to Anne Oxbrough**, who has been awarded an IRCSET-Marie



Curie International Mobility Fellowship through the IRCSET-INSPIRE scheme. Anne will soon travel to the University of Alberta in Canada, where she will conduct invertebrate biodiversity surveys in naturally generated mixed wood forests during a two year secondment from UCC. Comparable field and laboratory investigations will be carried out here in Ireland during 2012 in mixed conifer/broadleaf plantations, when she will return to the ZEPS department under the supervision of Prof. John O'Halloran.

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