



Issue 11
June 2012

INSIDE THIS ISSUE

- LONG-TERM WOODLAND MONITORING IN IRELAND 1
- INDEX OF WOODLAND BIODIVERSITY POTENTIAL 2
- HEN HARRIER CONSERVATION 2
- 2ND INTERNATIONAL CONFERENCE 2
- RHODODENDRON CONTROL PROJECT 3
- CLOSER TO NATURE FORESTRY 4
- MINISTER DEENIHAN LAUNCHES BOOK ON BIRD HABITATS 4
- CONGRATULATIONS TO KAREN MOORE 4



WELCOME

Welcome to the 11th issue of the PLANFORBIO Research Programme Newsletter. The five year HEN HARRIER research project came to a conclusion in March of this year. This was the second project in the programme to be completed and included a PhD by Barry O'Donoghue and a number of journal publications and policy input. The remaining PLANFORBIO projects, RHODO and BIOPLAN, are now in the data analysis phase and a wealth of publications and conference presentations of the findings are expected over the next year. The team are looking forward to the IUFRO Second International Conference on Biodiversity in Forest Ecosystems and Landscapes, which they will host at UCC in August.

LONG-TERM WOODLAND MONITORING IN IRELAND

Miles Newman

The current suite of semi-natural long-term monitoring plots being used in BIOPLAN are largely a result of work initiated in the late 1960's and the 1970's. These plots are spread between three National Parks and were established for a variety of reasons by a variety of people.

In the winter of 1969 work was underway on establishing 15 monitoring plots in the Derrybawn and Glendalough Oak woods of Wicklow Mountains National Park. This project was initiated by Mr Micheal Neff of the former Forest & wildlife Service with subsequently surveyors including Dr. John Cross and several members of the Botany Department at TCD. Unfortunately these plots are now in bad condition as many of the exclosures have fallen derelict. Upkeep of these plots is vital to the long-term monitoring dataset.

Dr. Michael Telford's work on 'past and present vegetation' in Glenveagh National Park, Co. Donegal between 1973 and 1976 resulted in the establishment of the first of several deer exclosures around the Park's small woodlands. These initial exclosures were added to over the next decade and again in 1987 by Lieveke Van Doorslaer and Aileen O'Sullivan. A total of 5 woodlands are now exclosed in the Park, however, due to intentional inclusion of domestic animals inside several exclosures, only 2 exclosures remain useable for testing the effects of long-term exclusion of large herbivores.

The Tomies Wood exclosure in Killarney National Park, set up in 1972, was a focus of Dr. Daniel Kelly's PhD thesis and he has mentioned the fact that this may be the place he has spent more fieldwork time in than any other, during his career. With the 50 year anniversary of this research project only a decade away, this plot has provided long-term insight into woodland regeneration and changes in community composition.



The enclosure at Tomies Wood in 2011 showing good inside/outside contrast

Additional exclosures were set up in the Yew and Oak woods of the Muckcross peninsula in 1969 and 1974 by Dr. Kelly and Dr. Alan Craig, respectively. These plots have been surveyed periodically since then, including an extensive survey of all plots by Dr. Phillip Perrin in 2001. A little later than the rest, a network of smaller unfenced permanent plots throughout Killarney National Park was established in 1991. A total of 87 plots now exist which have been surveyed in successive 5 year intervals since their initiation.

There are, however, constant intricacies with long-term plots as fence posts decay, trees fall on exclosure fencing, and important markers are accidentally removed. The great advantage of this work carried out 20, 30, and 40 years ago, is the true long-term monitoring datasets which have been created for these woodlands. In a time when the establishment of long-term monitoring plots is not in the interest of funders (as it does not produce instant results), we should try to remain farsighted, as long-term datasets are invaluable, regardless of transient economic chaos, particularly in helping us predict ecological shifts in the era of climate change. As useful a predictive tool as ecological models may be, there is no substitute for good long-term ecological monitoring.



INDEX OF WOODLAND BIODIVERSITY POTENTIAL

Linda Coote

Forests contain a large proportion of global biodiversity but, although European forest cover is currently approximately 45% of the land area, in Ireland, forest covers only 11%. This means that it is important that the biodiversity that is supported by the forests we have is maximised. Forest owners and managers therefore need information on how their woodlands measure up in terms of their potential to support biodiversity and on what they can do to improve this. Forest policy makers also need this information for our entire woodland resource. Because surveying the entire biodiversity of a woodland requires specialist knowledge and is rarely possible, there is increasing interest in using indicators of biodiversity. These are easily measured features which influence or are a reflection of levels of biodiversity. Assessing these indicators can therefore tell you what level of biodiversity a woodland can potentially support. For example, assessing the amount of deadwood can tell you about the potential of a woodland to support saproxylic species (species dependent during some part of their life cycle on deadwood).

PLANFORBIO researcher Linda Coote, from Trinity College Dublin is collaborating with Nadia Barsoum, from Forest Research, UK, on developing an index for Ireland, which would allow forest owners and managers to assess the biodiversity potential of their woodlands. This index is based on the Indice de Biodiversité Potentielle (Potential Biodiversity Index) which was developed in France by Laurent Larrieu and Pierre Gonin. Five indicators that can be influenced by forest management (number of native trees, number of vertical layers, amount of standing deadwood, amount of fallen deadwood, number of veteran trees, proportion of open areas) and four that cannot, but which also have an important influence on biodiversity (woodland continuity, area, presence of aquatic habitats, presence of rock and soil surface features) are suggested. The indicators can be assessed from a quick walkthrough of a wood and don't need any specialist knowledge.

Each indicator is given a score between zero and five and the scores are summed to give a maximum of 25 for the forest management-related indicators and 20 for the context-related indicators. The index is expressed as the percentage of the maximum for each part and allows forest managers to easily identify where there might be scope for improvement. The index is currently being compared to actual biodiversity data collected during PLANFORBIO. It is hoped that it can be further tested in the field so that it can act as a useful tool for woodland owners and managers and provide important information to forest policy makers.

2nd International Conference on Biodiversity in Forest Ecosystems and Landscapes

University College Cork, 28 – 31 August 2012

The DAFM funded Second International Conference on Biodiversity in Forestry Ecosystems and Landscapes will bring together scientists, industry members, producers, policy makers and others to the city of



HEN HARRIER CONSERVATION

Mark Wilson

The HEN HARRIER project was completed in March 2012. The aim of the project was to increase our knowledge of Hen Harrier breeding biology and habitat requirements to inform conservation management of this species in Ireland. During five breeding seasons from 2007 to 2011 detailed data was collected on Hen Harrier ecology in four study areas in Ireland using a range of traditional and novel methodologies including direct observations, nest cameras, GPS tags, pellet analysis and wing-tagging of juveniles.

Hen Harriers have declined in range and population over the past 200 years, and the breeding population is now concentrated in the south and west of Ireland, particularly in the counties of Cork, Limerick and Kerry. Despite some, more recent, population increases, this species remains vulnerable and is listed as a species of conservation concern on Annex 1 of the European Union Birds Directive. This Directive requires that Ireland takes measures to ensure the persistence of Hen Harriers through designation of Special Protection Areas (SPAs), within which appropriate steps must be taken to provide and maintain suitable habitat for Hen Harriers. There are six designated Hen Harrier SPAs in Ireland at present, all of which all include suitable Hen Harrier breeding habitat such as heaths and bogs, rough grassland and conifer plantations, and these must be managed in order to ensure the provision of suitable habitat in the face of future developments and land use change.

This project provided detailed scientific data on Hen Harriers that is essential if Ireland is to meet its obligations to protect Hen Harriers and their habitats under the EU Birds Directive, which can only be achieved with the support of good policies and management practices. There is scope to build on this significant body of work in the future to provide a more thorough understanding of Hen Harrier population ecology in Ireland, particularly in light of continued land use and climate change. The challenges that we face in this regard include investigations of the role of habitat quality in breeding success, the interaction between breeding and roosting populations, the fate of fledged young in Ireland and the source of our breeding population and factors of importance to Hen Harrier populations in the changing landscapes of the future.

Cork during the last week of August to share and exchange information on the sustainable management of forest ecosystems and landscapes.

More than 160 abstracts were submitted and have been incorporated into 12 sessions that will run over the four days of the conference. There will also be an excursion to Killarney National Park during the conference and an optional post-conference excursion to Gougane Barra.

The early bird registration deadline for this conference is June 30th 2012 and we invite you to register now to get the best rates. Students get even more discounts on registration. Further information can be found on the conference website at www.ucc.ie/en/iufro2012.

RHODODENDRON CONTROL PROJECT

Eddie Daly

The RHODO project, which began in 2008, was designed to assist landowners in controlling what had become a difficult alien invasive scrub species. Rhododendron, once established in an area, can have a malevolent and long-lasting effect on our native plants. Current methods of dealing with this problem are expensive, often ineffective and can be harmful to the environment, particularly when using chemical herbicides where multiple applications are necessary. This project was designed to create a control programme whereby landowners, having to deal with invasive colonies of Rhododendron, would have a framework with which they could design a control programme suitable to their situation. This study also set out to increase our knowledge of the species to inform improved control measures.

The aim of the first part of this study project was to provide a better understanding of the vegetative characteristics of Rhododendron. A study of seed germination, and to what degree the substrate depth affects germination, demonstrated that the depth of broadleaf forest litter is directly related to the germination success of Rhododendron seeds, which means that Rhododendron is more successful at establishing itself on disturbed land. Essentially what this means is that when clearfelling, or carrying out any other major land management, it would be prudent to ensure that there is little bare soil left exposed. Just 2-3 cm of forest litter reduced germination of the Rhododendron seeds from 50% of total seeds planted to just 5%.

An experiment was established to assess the effectiveness of reducing Rhododendron natural regeneration, after it has been cleared, by planting holly and birch. The problem it seems with our native scrub species like birch and holly is that they are favoured by browsing animals while Rhododendron is ignored by herbivores due to its toxicity. We cleared two sites of Rhododendron and planted each site with birch and holly. Half of each site was fenced off with deer fencing to see if protection against grazing animals affected the success rate of Rhododendron re-generation. The experiment was conducted at two sites, one in Lismore (podzolic soil) Co. Waterford, and one in Newport (peatland) Co. Mayo. At both sites the instances of Rhododendron seedlings was much greater outside the fenced area than inside the fenced area. Vegetation cover was more extensive both in ground cover and diversity of species inside the fenced area although not as pronounced on the peatland site. Also the survival of the planted scrub trees was higher inside the protected area on both sites, although of a higher percentage in Lismore than in Newport. Overall this shows that without protection from grazing animals the likelihood of Rhododendron establishing a colony is very high.

Pest control, both plant and animal, is one of the main concerns of forest managers. The most effective measures often have equally deleterious effects on non-target species. Glyphosate is the most commonly used herbicide treatment worldwide and is typically sprayed on the leaves of growing plants where it works by blocking the plants ability to produce essential amino acids. It has proven to be very effective against weeds and scrub species, but is a broad spectrum systemic herbicide which means that it can be harmful to most broadleaved species (woody, annuals, grasses etc.) as well as the target species.

These concerns are reflected in EU environment proposals and directives on the safe and responsible use of chemical herbicides which aim to severely restrict the use of glyphosate. It is therefore essential to identify alternative methods for rhododendron control, the most promising of which is the replacement of the chemical herbicide with a naturally occurring fungal herbicide. This part of the project set out to investigate the potential of *Chondrostereum purpureum*, a wood rotting fungus found mostly on fruit trees, in this regard. A past study conducted by a forest research team in Finland found that this fungus, when applied to cut-stumps of birch trees, had 70% success rate in preventing regrowth. The aim of the work was to test whether, when applied correctly, an Irish strain of the fungus could be used as an environmental and economically

sound replacement for glyphosate. We tested the fungus on cut-stumps of both Rhododendron and birch. Although this work is still on-going the fungal treatment appears to be causing cambium degradation and blackening of the stump at a similar rate as the glyphosate treatment and noticeably more advanced than the control. The difference between the fungal treatment and the control is noticeable in 70% of the population.

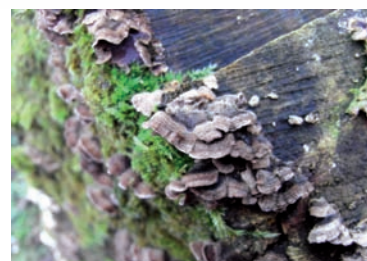
Invasive plants, including Rhododendron, are at their most dangerous and aggressive where continuity of natural habitat is broken and are therefore abundant on disturbed sites. Relatively small adjustments to land management practices in sensitive areas can reap benefits later on down the line. Particularly in the case of Rhododendron; prevention is better than cure.



Birch cut-stump – control treatment



Birch cut-stump – fungal treatment



Chondrostereum purpureum found on a plum tree in Tipperary



Birch cut-stump – glyphosate treatment



Rhododendron colony spreading through a mature stand of larch.

CLOSER TO NATURE FORESTRY

Nadia Barsoum

Towards the end of the 20th century and continuing to the present date, there has been a trend in forestry to revive a silvicultural concept that has been around since the early 1900's. That is, to practice 'close-to-nature', 'near-natural', or 'diversity-oriented' forestry. All of these forestry practices have the same basic aims of creating greater structural, compositional and functional diversity in managed woodlands, thereby mimicking more natural forest conditions. This can be achieved, in part, by mixing the age structure of the managed crop and/or introducing tree species, and particularly native tree species, to create a mixed species composition. There have been several key drivers of this trend. One of these has been public perceptions of the forestry industry which have been strongly disapproving of the 'unnatural' uniformity of plantation monocultures and the practice of clear-cutting in these forests which is considered to be environmentally damaging and unsightly. Another driver has been an increasing recognition that highly uniform

monocultures are more vulnerable than native and mixed woodland types to pest outbreaks, wind-throw and/or drought-stress, and this is especially true of forests composed of non-native tree species planted on poorly chosen sites. Further incentives to adopt 'close-to-nature' silvicultural practices stem from commitments under international agreements. 1992 saw the emergence of the United Nations Commission on Sustainable Development (CSD) and the Convention on Biological Diversity (CBD) requiring new and sustainable approaches to be taken in the management of forests with greater protection to be afforded to woodland biodiversity.

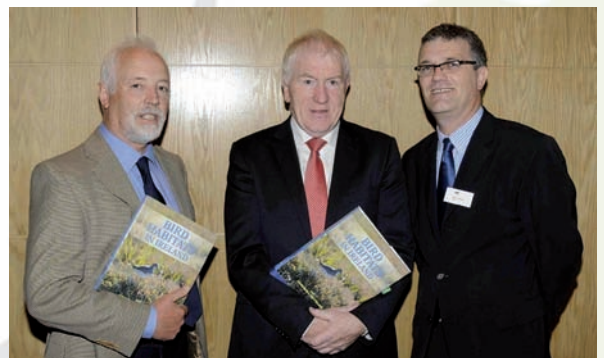
Research teams at Forest Research (UK), Trinity College Dublin and University College Cork have teamed up over the past year as part of the PLANFORBIO research programme to provide evidence for forest managers and forest policy-makers of the merits, or otherwise, of a closer-to-nature silvicultural

approach. Specifically, the teams are investigating the influence of a mixed tree species composition in plantation forests on forest-associated biodiversity. A range of biodiversity indicators are being used to describe and compare levels of biodiversity in monocultures and intimate mixtures of oak and Scots pine. A total of 15 Scots pine monocultures, 14 oak monocultures and 14 Scots-pine/oak mixtures located across Ireland and two forested regions in southern England were assessed in the 2011 field season. The sensitivity of these indicators to crop type and the directions of response of the various taxa will be compared. Studying pure and mixed plantations of Scots pine and oak will enable us to test our prediction that the benefits for biodiversity of establishing intimate mixtures of broadleaves and conifers would be greatest in plantations of slow-growing, open-canopied conifers (e.g. Scots pine) compared with more fast-growing, closed-canopy conifer species such as Norway spruce.

MINISTER DEENIHAN LAUNCHES BOOK ON BIRD HABITATS

The Minister for Arts, Jimmy Deenihan TD, launched *Bird Habitats in Ireland*, edited by Richard Nairn and John O'Halloran, at the RDS Dublin on Friday May 18th. This book details the most recent research on birds and their habitats in Ireland, and includes significant contributions from the PLANFORBIO team including Mark Wilson, Tom Kelly, Oisín Sweeney and Sandra Irwin.

Relevant recent research findings were presented at a symposium on the same day, with researchers offering both good and bad news for birds in Ireland. The recent colonisation of Irish habitats by woodpeckers and egrets, both virtually unknown here just 20 years ago, was welcomed. Continued habitat loss continues, however, to threaten a growing number of species including the Hen Harrier. Interestingly, climate change was reported to have a negative impact on some birds, but also to assist colonisation by others. Supported by BirdWatch Ireland, British Trust for Ornithology, The Royal Society for the Protection of Birds and University College Cork, the symposium was attended by over 200 birdwatchers, ecologists, policy makers and members of the public. Further details can be found at www.birdhabitats.wordpress.com.



Richard Nairn, Minister for Arts Jimmy Deenihan and Professor John O'Halloran at the launch of 'Bird Habitats in Ireland' at the RDS, Dublin.

CONGRATULATIONS!



Congratulations to Karen Moore who won the award for the best presentation in the forestry section of the ENVIRON conference in UCD in March for her paper: "Factors influencing the ground vegetation diversity of two successive rotations of non-native conifer plantations".

Dale Crammond, Department of Agriculture, Food and the Marine, presents Karen Moore with the prize for Best Forestry Presentation at Environ 2012.

WELCOME

We are delighted to welcome Conor Graham to the BIOPLAN team. Conor replaces Mark Wilson as the full-time post-doctoral researcher at University College Cork and has previously worked on the HYDROFOR project at UCC.

PROJECT PARTNERS

University College Cork
Programme Leader and PI:
Prof. John O'Halloran

Trinity College Dublin
PI: Dr. Daniel Kelly

Waterford Institute of Technology
PI: Dr. Nick McCarthy

Coillte
PI: Dr. Mick Keane

Forest Research, UK
PI: Dr. Nadia Barsoum

FOR FURTHER INFORMATION

Sandra Irwin

Programme Manager,
School of Biological, Earth & Environmental Sciences
University College Cork,
PHONE 021 4904595 E-MAIL s.irwin@ucc.ie

