FORESTBIO

Managing for biodiversity in a range of Irish forest types

PROJECT TEAM

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BACKGROUND

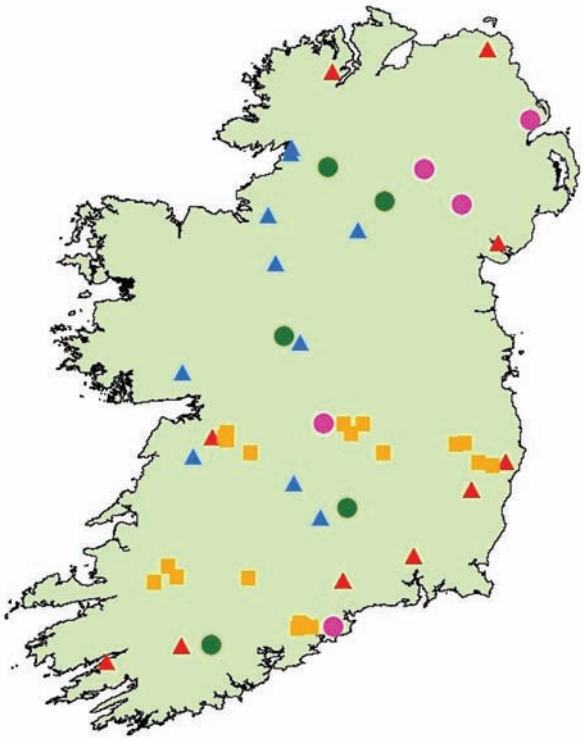
The COFORD/EPA funded BIOFOREST project (2001-2006) was an integral part of the emerging body of knowledge on forest biodiversity in Ireland following a period of intensive afforestation and associated landscape changes during the latter part of the twentieth century. Although expansion of the existing forest estate remains a priority, the character of Ireland's forests is undergoing considerable change. An increasing proportion of existing conifer forests is being harvested and restocked, and a high proportion of plantings now consists of a mix of conifer and broadleaved species. FORESTBIO seeks to address gaps in the knowledge of forest biodiversity in three forest types (second rotation conifer plantations, mixed tree species plantations and native woodlands) through surveys of plants, birds and invertebrates.

OBJECTIVES

- Determine the biodiversity of second rotation forests, mixed-species forests and native woodlands at different stages of the forest cycle.
- Make inter-forest type comparisons and comparisons with data from BIOFOREST.
- Identify indicators of biodiversity for different forest types and describe monitoring techniques.
- Identify measures that may be used to enhance the biodiversity of the different forest types.
- Compare Irish and UK forest biodiversity using existing data and study sites.

PROGRESS

The current reporting period was concerned primarily with data analysis by plant and bird specialists, and laboratory identifications by invertebrate biologists. Data entry has been completed for many of the taxa being studied and data analysis is well underway. The first results are beginning to emerge, particularly from the first and second rotation Sitka spruce plantation studies that compare the findings of the FORESTBIO research in second rotation plantations with the findings in first rotations of BIOFOREST project. For each taxon, analysis will also be undertaken on native woodland surveys, and on mixed plantation surveys, as well as an over-arching analysis across all three surveys at all 60 FORESTBIO sites.



FORESTBIO study sites: ▲ native oak woodlands, ▲ native ash woodlands, ● Norway spruce:Scots pine mixes and pure Norway spruce, ● Norway spruce:oak mixes and pure Norway spruce and ■ second rotation plantations.

This work is at varying stages of advancement for each of the target taxa. An analysis of deadwood in native and plantation forests has also been completed.

While a number of the taxa under investigation in this project can be identified in the field, invertebrate identification can only be undertaken in the laboratory with the aid of a microscope and specialised identification keys. The current reporting period has been mainly concerned with this aspect of the work for invertebrate biologists. Identification of all ground-dwelling specimens was completed in August and of canopy-dwelling specimens by the end of 2009. All data collected by researchers on this project are being compiled into a GIS database which will provide an updateable system that allows access, visualisation and further analysis of the spatial data component within the FORESTBIO project.

ACTIVITIES PLANNED

- Data analysis for each taxon under investigation (ground vegetation, epiphytes, invertebrates and birds) covering: afforestation versus reforestation at different stages of the forest cycle; canopy mixes; oak and ash native woodlands and inter-forest type comparisons.
- Analysis for each taxon will include species richness and abundance, species assemblages, identification of biodiversity indicators, management recommendations and specific methods used will be dependent on taxonomic group.
- Completion of cross-taxon analysis.
- Preparation of findings for dissemination at conferences and in peer-reviewed journals.
- Completion of the GIS database.
- Investigation of relationship between terrestrial laser scanning data and manually collected biodiversity data.

OUTPUTS

French, V., Oxbrough, A., Irwin, S., Kelly, T.C. and O'Halloran, J. 2009. *Moth diversity in native woodlands and plantation forests.* ENVIRON '09.

Irwin, S. 2009. A novel approach to forest biodiversity assessment. *Science Spin.*

Irwin, S., Kelly, D. L., Kelly, T., McCarthy, N., Mitchell, F., Coote, L., Oxbrough, A., Wilson, M., Martin, R., French, V., Fox, H., Sweeney, O., Moore, K. and O'Halloran, J. 2008. *Planning and management tools for biodiversity in a range of Irish forests.* (Poster presentation). Scientific Seminar in the connection to the European Forest Institute Annual Conference: Forest Ecosystem Management in the 21st Century, Dublin, Ireland.

Martin, R., Oxbrough, A., Irwin, S., Kelly, T.C. and O' Halloran, J. 2009. *Assessing the biodiversity of canopy arthropods in a range of forest types throughout Ireland.* 2nd European Congress of Conservation Biology: Conservation biology and beyond: from science to practice, Prague.

Terrestrial Laser Scanning image of native woodland structure.

Moore, K.A. 2009. *Bryophyte Identification.* Dublin Naturalists Field Club, March 2009.

O'Halloran, J. 2009. *PLANFORBIO*. Presentation to COFORD Council. Cork, March 2009.

Oxbrough, A. 2009. *Biodiversity indicators of ground-dwelling spiders in Irish plantation forsts and native woodlands.* ERI Research Open Day, UCC, May 2009.

Palmu, E. 2009. *Initial effects of afforestation on ground beetles* (Coleoptera: carbidae) *in Irish grasslands and peatlands.* MSc Thesis, Lunds University, Sweden (Practical work carried out at UCC.

Sweeney, O.F.McD. 2009. *Woodland and Forest Biodiversity. Trees - why we need them.* Dunmanway, October 2009.

Sweeney., O.F.McD., Wilson, M.W., Irwin, S. Kelly, T.C., and O'Halloran, J. Bird communities of second rotation plantations in Ireland at different stages of the forest cycle. Submitted to *Ibis*.

Sweeney, O. F.McD., Wilson, M., Kelly, T.C., Irwin, S. and O'Halloran, J. 2008. *Bird diversity and abundance in different stages of the forest cycle in first and second rotation plantation forests.* Current Ornithological Research in Ireland: 5th Ornithological Research Conference, University College Cork, November 2008.

Sweeney., O.F.McD., Wilson, M.W., Kelly, T.C., Irwin, S. and O'Halloran, J. 2009. *What differences exist between the bird communities of first and second rotation plantation forests?* In: Keller, V. and O'Halloran, J. (eds) 7th Conference of the European Ornithologists' Union Abstracts, Swiss Ornithological Institute, Sempach.

Sweeney., O.F.McD., Wilson, M.W., Kelly, T.C., Irwin, S. and O'Halloran, J. 2009. *Bird density and species richness in native and plantation woodlands in Ireland: what differences exist and why?* 2nd European Congress of Conservation Biology: Conservation biology and beyond: from science to practice, Prague.

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

John O'Halloran is a partner in a consortium preparing a bid for funding under ENV.2010.2.1.4-1 Functional significance of forest biodiversity. This bid is based on a pan-European partnership with partners including CEH (UK), ALTER Europe, LTER Europe and ICO forests as well as a number of universities. The aim of the proposal is to integrate, enhance and facilitate the use of European research on the significance of forest biodiversity for ecosystem functioning and the provision of ecosystem goods and services.

A 'Mammals in forests' workshop was hosted by FORESTBIO research project at the all Ireland Mammal Symposium, Waterford Institute of Technology and the National Biodiversity Data Centre, 8 November 2009.

Oisín Sweeney presents the findings of his work on FORESTBIO at the 2nd European Congress of Conservation Biology at the Czech University of Life Sciences.