# Assessing the biodoversity of canopy arthropods in a range of forest types

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## Introduction

Over the last century, forest cover in Ireland increased from less than 1% to almost 10%, mainly through the creation of industrial-scale plantations of non-native trees (Iremonger et al., 2006).

Forest canopies make a large contribution to global biodiversity, and they also make up the bulk of photosynthetic material and biomass in forest ecosystems (Lowman & Wittman, 1996).

Canopy invertebrate biology is a relatively new science discipline, particularly in Ireland. Canopy research offers the opportunity to investigate the ecological interactions between organisms in a forest canopy and their environment (Lowman & Wittman, 1996).

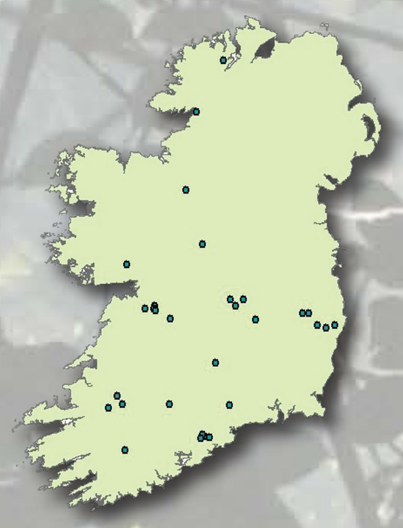
Invertebrates are an important component of biodiversity, yet little is known of invertebrate biodiversity in Irish forests, especially in the canopy.

## Aims and Expected Outcomes

This project aims to:

- Collect canopy invertebrates from a range of different forest types, including non-native plantations and native woodlands, using a thermal fogging method.
- Provide an inventory of the canopy arthropods present in different forest types, as well as a detailed account of the biodiversity and functional groups present.
- Increase the knowledge base of canopy arthropod ecology in Ireland.
- Inform management decisions so that future forestation programmes will aim to increase biodiversity and naturalness in the forest ecosystem.

## Site Descriptions



Several different forest types will be surveyed:

1. Native Woodlands:
   - Native woodland sites of WN1 (*Quercus-Betula-Ilex*).
   - Native woodland sites of WN2 (*Quercus-Fraxinus-Corylus*).
2. Non-native Plantations:
   - Reforestation sites: mid-rotation and mature growth stages.
   - Afforestation sites: mid-rotation and mature growth stages.
3. Canopy Mixes:
   - Different canopy mixes of native broadleaf and non-native tree species

## Canopy Fogging Method

- Insects are collected from the canopy by thermal fogging, using a petrol-driven fogging machine, and a natural pyrethroid insecticide.
- At each fogging plot, plastic sheets with a total area of 24m^2 are suspended above the ground, underneath the canopy to be fogged.
- Each sample sheet slopes downwards towards its middle, preventing the fallen insects from sliding off the sheet.
- The plastic sheets remain in place for 3 hours after fogging to allow for adequate drop-time of the invertebrates onto the collecting sheets (Stork & Hammond, 1997).
- Insects are then gently brushed from the sample sheets into sample bottles containing 90% alcohol, which are then sorted and identified to species/family level in the laboratory.
- Arthropods collected include arachnids, opiliones & diptera.
  Identification and analysis will focus on functional groups and biodiversity.

This project is part of the PLANFORBIO research programme (http://planforbio.ucc.ie) funded by COFORD under the National Development Plan 2007-2013

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