Sampling for woodland beetles (including saproxylic species) in one of Ireland's most important surviving ancient woodlands

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What is a "saproxylic" beetle?

Saproxylic beetles (Fig. 1) are species involved in or dependant on, dead and/or decaying woody tissues, the process of the fungal decay of wood, and/or the products of that decay.

Why should we study and conserve them?

Saproxylic beetles are ecologically important. They make up a large portion of insect diversity in European forests and play key roles in ecosystem functioning through the provision of beneficial services e.g. pollination, deadwood decomposition and nutrient-cycling. Despite their importance, many species are declining across Europe. Furthermore, they are an understudied insect group (particularly in Ireland) meaning we do not fully understand their current status, their ecological needs and how best to conserve them. Filling these knowledge gaps is crucial if we want to protect these species and the ecosystem services they provide.

Current Study:

To help address current knowledge gaps, we developed a robust sampling strategy for saproxylic and other woodland using beetles. The study was conducted in St. John's Wood, Co. Roscommon, one of Ireland's largest surviving ancient woodlands. We compared the effectiveness of three trap types (intercept, emergence and pan) for collecting beetles. We also tested for any possible effects of pan trap colour (blue, white and yellow) and intercept trap direction (north, east, south and west). Traps were set on and around veteran Oak trees (Fig. 2).

We collected 1,937 beetles (32 families and 163 species). Saproxylic beetles were a major component of the overall beetle community, making up 55% of beetle species and 43% of beetle individuals (Fig. 3). Of the 32 families found, 22 had saproxylic species.

Each trap type collected saproxylic species and distinct subsets of the overall beetle community. This indicates that a combination of trap types is required to capture a more comprehensive picture of saproxylic beetle assemblages. Intercept traps collected the highest abundance and species richness of beetles (including saproxylic species), followed by pan and emergence traps. Emergence traps, however, found the highest proportion of saproxylic species, relative to their total catch and are, therefore, useful for saproxylic-focused studies. Also, an emergence trap collection provides unequivocal evidence of a breeding population at a site.

Pan trap colour and intercept trap direction had moderate influence on local beetle assemblages. Blue pan traps collected significantly more beetles than white and yellow (including saproxylic species). North-facing intercept bottles (closest to the tree trunk) caught fewer beetles than those facing south and west.

Looking Ahead:

This study is part of a PhD project at the University of Galway (Applied Ecology Unit, School of Natural Sciences) which aims to improve our knowledge of saproxylic beetle ecology in Ireland and promote their conservation. The findings will inform future beetle surveys, checklists, red-lists and conservation measures. The project is funded by the Irish Research Council (Government of Ireland – EPA Postgraduate Scholarship).

Figure 1: Saproxylic Beetle - Rhagium bifasciatum "the two-banded longhorn beetle" (A. Crowe, 2022)

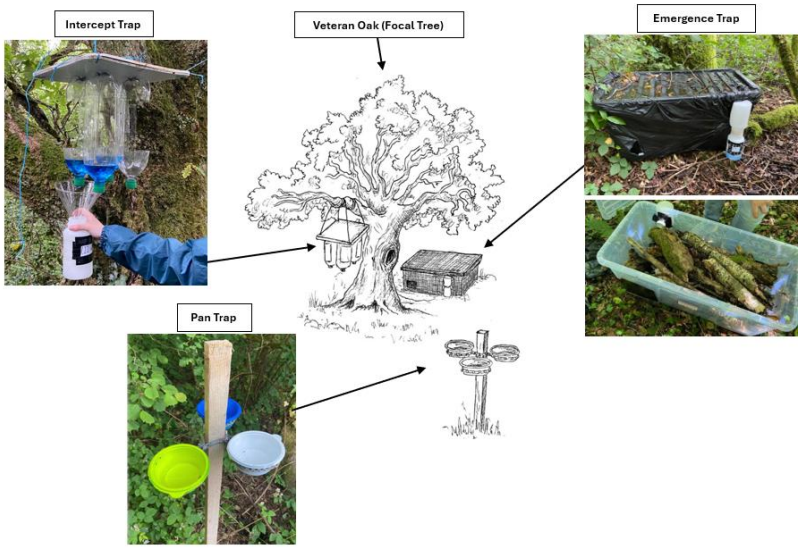

Figure 2: Trap set-up at each veteran oak tree (A. Crowe, 2022)

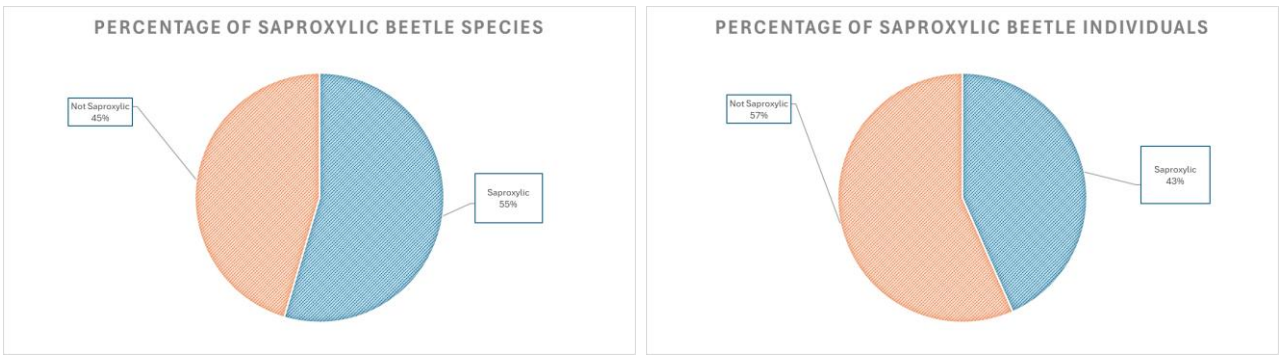

Figure 3: Percentage of saproxylic species and individuals found in St. John's Wood