

Can roads be used to enhance forest biodiversity?

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Introduction

Over the last century forest cover in Ireland has increased from 1% to 10%, mainly through the establishment of non-native plantation forests (Forest Service 2007). These forests are important for biodiversity, particularly in the context of Ireland's participation in the Convention on Biological Diversity.

Spiders and ground beetles are useful bioindicators in forests, due to their responses to environmental factors (Pearce & Venier 2006).

One feature of plantation forests that can be manipulated to encourage biodiversity is the open space in forest roads (Oxbrough et al. 2006). The standard forest road-width currently recommended by Forest Service guidelines is 15 metres (Forest Service 2004).

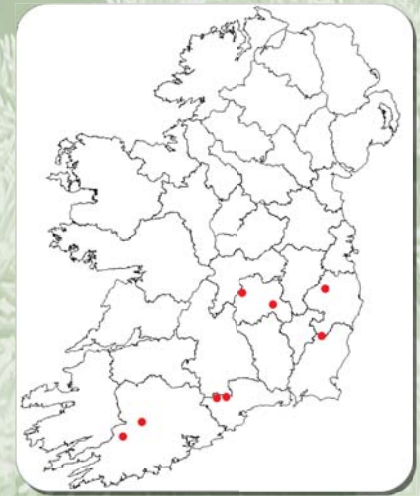


Fig 1. Study site locations

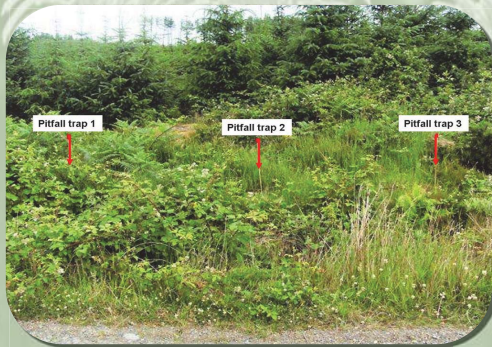


Fig 2. Open 1 transect at standard road-width plot

Aims

- To establish long-term monitoring plots which can be re-surveyed.
- To assess the effect of forest road-width on invertebrate biodiversity at each stage of the forest cycle.

Methods

- Eight manipulation sites were selected in second rotation plantation forests (Fig. 1).
- Spiders and ground beetles were sampled by pitfall trapping in 2005 and 2010.
- A "standard" 15m road-width and a "wide" 30m road-width were established in each site.
- Three plots were set up in each treatment at 50m, 100m, and 150m along the road.
- Spiders and ground beetles were extracted from the samples and identified to species level.

Expected outcomes

- It is hypothesised that a wider road-width will increase species richness and abundance.
- The results of this research will support forest management decisions to encourage sustainability and biodiversity in future Irish forests.

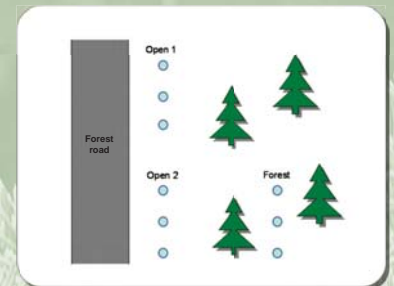


Fig 3. Standard road-width pitfall transects

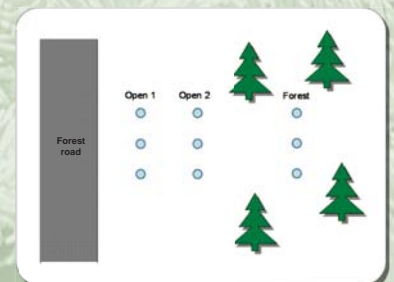


Fig 4. Wide road-width pitfall transects

References

- Forest Service 2004. Forestry Schemes Manual. Dublin: The Stationery Office.
Forest Service 2007. National Forest Industry: Republic of Ireland Results. Department of Agriculture, Fisheries and Food, Ireland.
Oxbrough AG, Gittings T, O'Halloran J, Giller PS, Kelly TC 2006. The influence of open space on ground-dwelling spider assemblages within plantation forests. Forest Ecology and Management 237: 404-417.
Pearce JL, Venier LA 2006. The use of ground beetles (Coleoptera: Carabidae) and spiders (Araneae) as bioindicators of sustainable forest management: A review. Ecological Indicators 6: 780-793.