

# Preliminary investigation into the threat of Bronze Birch Borer (BBB, *Agrilus anxius*) to Scotland

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# Introduction

Bronze birch borer (BBB, *Agrilus anxius*):

- native to North America
- breeds in birch trees (*Betula* spp.)
- periodically causes severe damage and mortality

Eurasian birch species, including silver birch (*B. pendula*) and downy birch (*B. pubescens*), are highly susceptible to BBB even when healthy.

This has restricted their planting in North America.

BBB poses a threat to Scotland, due to both BBB's cold climate tolerance and the importance and abundance of birch here.



**Figure:** Adult bronze birch borer (*Agrilus anxius*).

Source: Whitney Cranshaw, Colorado State University, Bugwood.org

# Project aims

**To assess the threat posed by bronze birch borer (BBB) to Scotland and the wider UK, and to inform risk assessment, surveillance, and contingency planning by identifying key risks and knowledge gaps.**

Project components:

1. Review the UK distribution of native and established *Agilus* species
2. Model the potential distribution and establishment likelihood of BBB
3. Investigate potential pathways for BBB entry into the UK
4. Evaluate the feasibility and effectiveness of available BBB surveillance methods for use in Scotland



**Figure:** Thinning crowns of silver birch (*Betula pendula*) trees caused by a bronze birch borer infestation. Image credit: Crown copyright. Forest Research

# Results

## 1. Monitoring and detection

- Ten *Agrilus* species are currently recorded in the UK (five native, five established since the early 1990s).
- Most restricted to a southern England distribution.
- One historic record of *A. viridis* from Scotland.
- Under-recording of existing UK *Agrilus* species may help or hinder the detection of invasive species (e.g. BBB).



**Figure:** Two colour variations of the native UK *Agrilus* species - *Agrilus viridis* (Hackston, 2014)

# Results

## 1. Monitoring and detection (con)

- Trialled three interception trap types used in North America to monitor BBB and EAB (*Agrilus planipennis*):
  - Green or purple sticky prism or multi-funnel traps
  - Successful captures rely on the positioning of traps in open, sunny areas.
- Traps tested in field trials in Scotland did not catch any native or non-native *Agrilus* species. Each trap type offered different logistical strengths and limitations, including time and labour requirements and non-target captures.

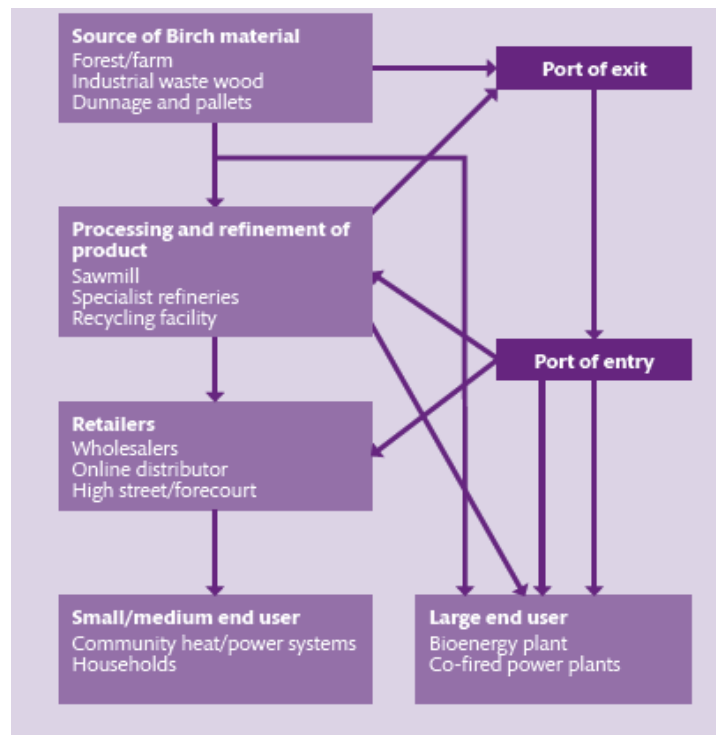
**Figures:** Green Fluon coated (12 funnel) multi-funnel trap; purple sticky prism trap; K Dainton inspecting green sticky prism trap (©Crown copyright, Forest Research, 2021).



# Results

## 2. Pathways of introduction

- Current risk via birch pellets or chips for biomass is low as unlikely beetles would survive production processes.
- Risk could rise if trade patterns shift due to economic or political pressures.
- Smaller pathways involving unprocessed birch into the UK from North America (e.g. craft materials) remain poorly characterised and carry substantial uncertainty.
- Initial infestations are most likely near major trading ports in southern England.
- Key knowledge gap - movement of birch within the UK is poorly documented

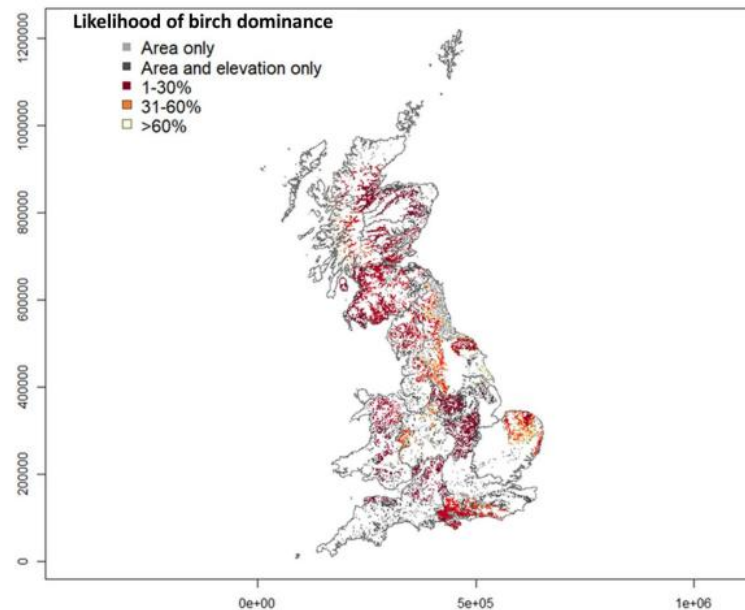


**Figure:** Pathway of imported birch material from source through processing to final end users.

# Results

## 3. Host–pest interactions

- Species distribution modelling indicates that birch is widespread across Great Britain up to around 675 m elevation.
- In North America, BBB is widespread and not strongly limited by temperature, suggesting few climatic barriers to establishment in the UK.



**Figure:** Predicted areas of birch dominance across 14 National Forest Inventory regions, based on birch presence per sample square and filtered by estimated birch area (light grey), elevation ranges (dark grey), and their overlap, indicating likelihood of dominance (red: 1–30%; orange: 31–60%; yellow: >60%).

# Conclusions

- The widespread distribution of birch across the UK, combined with the lack of clear climatic barriers, **indicates a very high likelihood that BBB would establish if introduced.**
- BBB therefore poses a significant threat to Eurasian birch, including UK populations. Preventing introduction is critical, supported by continued research, strengthened surveillance, and preparedness measures to enable early detection and rapid response.

# Acknowledgements

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# Questions



**Figure:** Larval feeding galleries of the bronze birch borer (*Agrilus anxius*). Photograph: David G. Nielsen, The Ohio State University, Bugwood.org