Evaluating the value of horizon scanning methods to assess threats to British-grown trees

Project overview

British forestry is highly reliant upon non-native tree species such as Sitka spruce and Douglas-fir which originate from western North America. However, non-native trees may be at risk from native pests and diseases, the threats of which can be intensified by climate change. There is, therefore, an urgent need to develop approaches for identifying potential new threats, to inform new tree planting schemes and ensure future forest health.

This project aimed to develop an innovative, data-driven horizon scanning framework for identifying threats to key tree species growing in Britain. This approach could also be extended to other species, including native British species growing in other parts of the world.

Key findings

We carried out a rapid review of existing horizon scanning methods and tools, and assessed them for their strengths, weaknesses, gaps and opportunities:

- We found that existing horizon scanning methods are not routinely incorporated into current forest health risk assessment approaches to provide the thorough, multi-dimensional and robust approach needed to reliably identify future threats to a particular tree species.

- Significant improvements could be made by integrating both current and projected future climate data into horizon scanning methods. Incorporation of existing data sets and tools (such as Forest Research's Climate Matching Tool) could easily provide finer resolution and ultimately, more meaningful, climate data. The Inclusion of climate projections could also help with prioritising pests and diseases for further investigation.

- Limitations in current horizon scanning approaches also include (a) the large pool of potentially damaging organisms and, (b) an overreliance on expert judgement or knowledge.

- A tree health horizon scanning exercise does not need to rely on a single method. Different approaches can be used at different stages of the process. For example, one method or tool

might be used to produce a list of pests and diseases that could affect a particular tree species or geographical area, and another tool or method may be used to prioritise them.

Based on our review of horizon scanning and biosecurity modelling approaches, we have proposed a new framework for a robust, data-driven horizon scanning approach for identifying threats to a tree species of interest, that takes greater account of climate change and rich, detailed data sources.

To test our proposed framework, we have begun a horizon scanning exercise to identify threats to Sitka spruce and Douglas-fir. To date, we have identified:

- Potential data sources.

- 147 pests and diseases of Sitka spruce and Douglas-fir, as well as non-biological (e.g. climate) threats, in their native ranges in western North America.

- Regions that are climatically similar to areas of the UK, or are likely to be in the future, and can therefore provide insights into possible current and future threats to UK trees.

- Opportunities for transdisciplinary, international collaborations to tackle the forest health issues that cross borders.

Future work

Potential further research could complete the development of a comprehensive and multi-factor horizon scanning approach to identify, risk-assess and mitigate potential health threats to principal tree species planted in the UK.