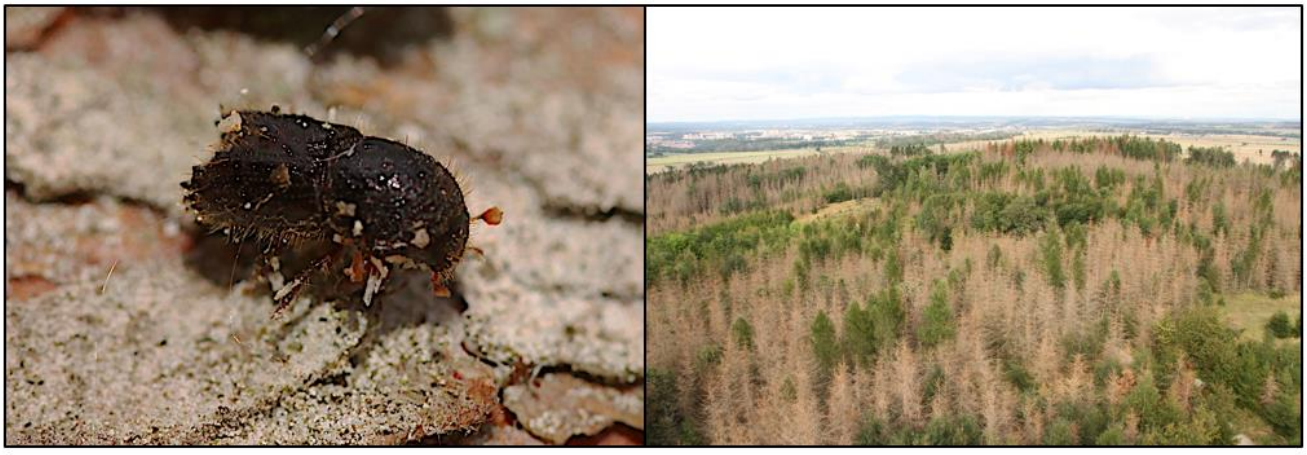
Larger Eight toothed spruce bark beetle (*Ips typographus*)

Status

- Endemic in European conifer forests with occasional outbreaks often triggered by a variety of stress events (e.g. repeated drought years or windthrow from storm events).
- Regular interceptions at port facilities in UK.
- Small breeding population discovered in November 2018 in Kent. Active eradication activities in vicinity and surveillance to date (September 2019) suggests no wider spread. Arrival may have been spillover of European populations in favourable summer conditions (high temperatures and easterly winds), although via transport pathways is also a possibility.
- Spruce trees (including Norway spruce and Sitka spruce) are vulnerable to attack, particularly when stressed, leading to decline in condition and mortality. Healthy trees may be attacked and suffer when beetle populations become particularly high.
- Large-scale sanitation felling often instituted in Europe to reduce spill over to healthy trees, but can be controversial when assessing the extent to which the dynamics are natural or man-induced (e.g. Bialowieza, Poland)
- Examination of characteristics of the Kent outbreak and evidence for population development in UK conditions is underway by Forest Research
- **Establishment in the UK, especially in forests in close proximity to Scotland, would be of major concern to commercial forestry.**



Ips typographus beetle; Ips-related damage in a spruce forest in Czech Republic. Credit: Max Blake, Forest Research

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Scottish-specific issues

- Scotland's forests are predominantly coniferous, with spruce trees - especially Sitka spruce (*Picea sitchensis*) as the major component.
- A significant domestic industry (sawmilling, wood-processing, and biofuel) is dependent upon a regular and substantial supply of softwood from spruce forests.
- Establishment of *Ips* in forests in or close to Scotland would be of major concern to growers and wood-using industries. It might impact upon investor confidence and some export markets (e.g. from the Protected Zone against non-native bark beetles in the West of Scotland to Ireland).
- Scotland's windy climate means that wind-thrown trees are ever-present in Scottish forests; very occasional but inevitable large-scale catastrophic storms (e.g. 1953, 1968, 1990, 2003) would provide ideal conditions for a population to develop and outbreak. Drought conditions, e.g. as forecast in climate projections to increase in Eastern Scotland, would also predispose trees to attack as would major attacks by green spruce aphid (*Elatobium abietinum*).

Knowledge Gaps

- Life-cycle and behaviour in Scottish conditions.
- Pathways of arrival into Scotland (e.g. direct from Europe, or via elsewhere in UK).
- Rate of spread to Scotland and prospects for containment if founding populations develop in other (warmer) parts of the UK.
- Extent of stressed trees as climate changes and in extreme (e.g. drought) years.

PHC Perspective

A known threat based on profiling in Europe – for which vigilance has been practiced for many years. However, warming trends, uncertainties over trade pathways, record of interceptions and the founding population in Kent, all indicate no scope for complacency.
Awareness of professionals is important given the desirability of early detection in mature spruce forests.

Key Priorities and Recommendations

- Build awareness in the sector (including forest managers, felling contractors and hauliers) to look out for and report suspect trees.
- Refine detection and surveillance methodologies.
- Keep contingency plan updated on basis of latest information and experience gained in eradicating Kent population.
- Maintain links with European researchers to parameterise models that inform contingency planning and outbreak management.
- Research the likely behaviour in Scottish conditions.

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