

# Assessment of large-scale biosecurity risks to Scotland

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PHC2019/04/05/06 - Policy Summary



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# 1 Policy Summary

## ***Introduction***

Plant pests and diseases pose a threat to Scotland's horticulture, agriculture and forestry sectors as well as its natural environment. The movement of plants are implicated in the introduction and spread of pests and diseases but the networks of organisations and businesses that grow, trade, transport, purchase and manage these plants are also key allies in tackling biosecurity threats, helping to protect socio-economic as well as ecological benefits. For example, retail horticulture in Scotland alone is estimated to contribute £300 million to the economy<sup>1</sup>. However, the potential pathways and biosecurity risks of large-scale movement of plants in Scotland are largely unknown.

Scotland's Plant Health Centre (PHC) commissioned an assessment of large-scale biosecurity risks with a focus on three areas of concern: (1) non-specialist and online horticulture sales; (2) landscaping and infrastructure; (3) planting for environmental benefits. An additional area was the potential for modelling to support decision making across these areas of concern. Between April 2020 and March 2021, the research team conducted mixed methods research, including literature reviews, surveys, interviews, workshops and case studies. An Expert Advisory Panel was convened from across the sectors to ensure that research questions and methods were appropriate, to assist with hard-to-reach cohorts and to provide expert input to some project elements. These projects were exploratory in nature, aiming to outline the potential scope of the challenges and to identify areas of immediate concern in the current context. Please see appendix for a summary of the methods and results from each project.

## ***Key Findings and Suggested Responses***

**FINDING 1: The impacts of emerging plant health threats are poorly understood across sectors in Scotland resulting in a lack of preparedness for future pest and pathogen outbreaks**

### ***Responses required include:***

- 1.1. Enhancement of strategic evidence-based horizon scanning to identify pests and pathogens of greatest likely future impact in Scotland.
- 1.2. Evaluate the most effective mechanisms for raising awareness of current and imminent plant health risks, to maximise the impact of communication activities and engender positive action for enhanced resilience.
- 1.3. Deliver targeted communications to increase preparedness.

**FINDING 2: Widespread lack of clarity on individual and organisational responsibility for plant health in planting schemes produces inconsistent approaches to biosecurity**

### ***Responses required include:***

- 2.1. Assess where the biggest and most impactful gaps are in biosecurity responsibility in Scotland, including known 'transparent' gaps (where it is clear that biosecurity is not adequately addressed), and 'opaque' gaps (where it is possible that biosecurity is adequately covered, but lack of effective communication channels precludes critical evaluation of risk).
- 2.2. Work in partnership with relevant organisations to develop a biosecurity risk assessment and best practice framework, providing practical steps to assess risks and guide actions. This should include

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<sup>1</sup> Scottish Horticulture Panel (2018) The Scottish Horticulture Action Plan

clarification of biosecurity roles and responsibilities (to minimise the risks of everyone assuming someone else is responsible) and be integrated with appropriate quality assurance schemes (e.g. Plant Healthy).

- 2.3. Where there is a lack of clarity on what biosecurity measures are in place (i.e. in hard-to-reach sectors), evaluate options to ensure appropriate accessibility of information from major actors.

**FINDING 3: System wide structural support is needed to enhance plant biosecurity in Scotland given the increasing frequency of threats from pests and pathogens and the complexity of the supply chain via which plant material is obtained**

***Responses required include:***

- 3.1. Develop a policy map summarising how different policies impact on plant health and biosecurity in Scotland, to provide a framework for identifying where policy change may be needed.
- 3.2. Evaluate which policy levers provide the most effective interventions to decrease plant health risks in Scotland, including assessing best practice from other countries and sectors.
- 3.3. Work with experts in procurement to evaluate whether plant health and biosecurity could/should feature as a prominent criterion for quality assessment in the tendering process as part of steps to reduce plant health risks.

**FINDING 4: Biosecurity actions vary widely across sectors with very little cross-sector learning or collaboration on plant health**

***Responses required include:***

- 4.1. Support cross-sector dialogue to share best practice and support the development of evidence-based general and sector specific guidance (see 2.2)

## ***Appendix: Summary of methods and results***

The aims of the three projects were to understand plant procurement, movement and planting processes; explore biosecurity knowledge and awareness; assess biosecurity risks; and identify potential routes by which the PHC and other networks and actors could strengthen biosecurity in the large-scale plant trade.

### ***Assessment of large-scale plant biosecurity risks to Scotland from non-specialist and online horticulture sales***

The biosecurity knowledge and practices of non-specialist (e.g. supermarkets, DIY and Lifestyle stores) and online horticulture retailers were little known. A survey was carried out with 100 specialist and non-specialist retailers who sell plants online. It was more difficult to recruit non-specialist retailers, but four key informant interviews were conducted with large 'multiples' retail chains. All participants were from businesses based or operating in Scotland.

Survey findings showed:

- A high proportion of plants are grown from seed (> 60%).
- More than 80% of plants brought in are sourced from UK suppliers, although this does not guarantee that the plants are 'home grown'.
- Biosecurity knowledge and awareness reflects a greater concern with pests and pathogens that are widely present in the country with less attention paid to potential future threats.
- We investigated the importance of plant biosecurity in a selection of plant suppliers by ranking nine characteristics.
- Plant quality was consistently high but biosecurity consistently low.
- The relationship between plant quality and biosecurity is not well understood, as high quality may imply high biosecurity, and so this relationship requires further investigation.
- A range of biosecurity actions were conducted by most businesses, including plant inspection on arrival and seeking information on pests and diseases. However, being unsure about what actions to take, waiting for others to take action first or perceiving that any measure taken will not work, were each listed as barriers to action by around 50% of all respondents.
- Although the launch of the Plant Healthy Certification Scheme is relatively recent (2020), over 70% of those surveyed participated or were interested in the scheme.
- Schemes like Plant Healthy were considered beneficial both in terms of improving biosecurity standards with a minimum industry standard, and potentially increasing confidence amongst consumers that plants are pest and disease free.
- Constraints to greater participation in such schemes included the perception that there would be low uptake across the sector and the costs involved in implementing higher biosecurity standards.
- Some multiples (e.g. supermarket or DIY store chains) felt that their internal auditing processes and supplier agreements are biosecure so would need to clearly see the benefits of an external certification scheme.

### ***Assessment of plant biosecurity risks to Scotland from large scale plantings for landscaping and infra-structure projects***

Large-scale landscaping for developments, public open spaces and infrastructure (e.g. roadside) provide aesthetic, recreational and ecosystem service benefits. However, the scale of these interventions poses a biosecurity risk. This research investigated awareness, attitudes and behaviours of key actors along the planning to planting pathway, including plant specification and design through to planting and ongoing maintenance. We conducted a

tracing exercise, selecting 11 projects from the public planning portal that covered a broad range of large-scale developments including residential properties, campus (e.g. university building, business or retail parks), urban open spaces and infrastructure (e.g. transport). We contacted landscape architects, local authorities, developers, landscape contractors, site managers and clients and were able to secure interviews with most of these categories of stakeholders. A further set of conversations were held in relation to landscaping on trunk roads and in a large country park that had experienced a *Phytophthora lateralis* outbreak some years ago to identify lessons learned.

Our results demonstrated:

- Pest and disease awareness is generally low, and biosecurity is often not a priority.
- Occurrence, and thus experiences, of plant pest and diseases were low.
- Analysis of planting specifications reveals low levels of plant species diversity.
- There was a lack of clarity over where responsibility lies for biosecurity considerations and little connectivity between actors along the 'planning to planting pathway' such that decisions with potential biosecurity implications often remain unchecked. For example, decisions regarding sourcing and replacement of plant species are often not reported back to landscape architects.
- There are challenges with procuring biosecure planting material due to availability of stock and size requirements, lead-in times needed to deliver large volumes of specified plants and inevitable value engineering to reduce costs.
- Despite a general lack of knowledge amongst our sample, participants expressed an interest in learning more about biosecurity. This presents an opportunity for training and membership organisations and networks to play a greater role in improving biosecurity guidance within their sectors.
- Introducing a biosecurity risk assessment into the planning to planting and maintenance process could also enhance biosecurity.

### **Assessment of plant biosecurity risks to Scotland from large scale tree planting for environmental benefits**

There are ambitious targets for large-scale planting for woodland creation or expansion and habitat restoration that will provide significant environmental and socio-economic benefits. Current capacity within UK nurseries to service the demand for trees is growing but still lacking. Imports can pose a threat to tree health but there are also risks of pests and disease spread within Scotland and the wider UK if biosecurity protocols are not implemented. Using a case study approach, this project explored awareness levels around pest and disease threats, decision-making processes involved in specification, sourcing, planting and maintenance, inclusion of biosecurity consideration (if any) and lessons learned. Five case studies in Scotland were selected to cover a range of characteristics including location, site conditions, ownership structures, management objectives, species choice, supply chains and management activities across historic, current and future large-scale planting schemes. Methods included interviews with key case study actors and a review of documentary evidence. Results indicate that there is relatively high awareness of existing pest and disease issues (e.g. ash dieback, *Phytophthora sp.* but also deer), which is reflected in a focus on existing threats, with the management of deer pressure often considered a top priority.

Results showed:

- There were concerns about how future climate changes may increase pest and disease impacts and a recognition that more preparation was needed to increase treescape resilience against new threats.

- Practices to ensure the ‘right tree is in the right place’ were common in the case studies, with the aim of reducing plant stress and providing the best chance for tree establishment and long-term health.
- Other activities included using local provenances and seed, assessing soil conditions and locating vulnerable species away from highly visited areas.
- Onsite biosecurity practices are encouraged such as ensuring vehicles and equipment have been cleaned to prevent contamination, locating areas for plant stock checking and quarantining and the use of sterilised growing mediums that match local soil conditions.
- Participants lacked a shared understanding about which specific biosecurity checks and procedures are best suited to their schemes, highlighting the need for better guidance in this context.
- Using trusted nursery suppliers is considered paramount but challenges were highlighted such as their ability to provide large numbers of selected provenances.
- Having to procure trees from a selection of nurseries has the potential to increase trade traffic and therefore biosecurity risks.
- The recently announced Forestry Commission Nursery Notification Scheme could address some of the issues around timing associated with demand and supply.
- Some nurseries are looking to enhance biosecurity standards through engagement with the Plant Healthy Certification Scheme.
- A need for wider awareness raising – including for visitors – was noted, as well as exploration of what influences better biosecurity behaviours more broadly.

### **Potential of ecological and epidemiological models to inform assessment and mitigation of biosecurity risks arising from large scale planting**

An additional value of this interdisciplinary collaboration was an exploration of the potential for ecological and epidemiological models to inform assessment and mitigation of biosecurity risks arising from large-scale planting. The team from UKCEH and University of St Andrews undertook a literature review of specific ecological and epidemiological models that can or have been applied to predict or understand biosecurity risks at different stages of invasion pathways. Two stakeholder workshops with expertise from horticulture, agriculture, forestry and conservation discussed knowledge sources and gaps and piloted recently developed biosecurity risk assessment tools. Workshop participants identified how modelling could improve biosecurity risk assessments through horizon scanning and predicting and prioritising impacts of multiple pest and pathogen threats in the context of wider environmental issues such as climate change.

It was recommended that:

- Models be co-designed with stakeholders and integrated with existing tools to support decision-making such as ESC (Ecological Site Classification) that predicts survival and yield of different tree hosts under current and future climate conditions.
- Cross-sectoral collaboration at all levels is required to collect and hold data on historical and current plant choices, locations and ecosystems as well as pest and pathogen detection, spread and impact.

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