

Assessing the spread of *Phytophthoras* in Scottish forests by recreational and harvesting activities using comparative qPCR and metabarcoding techniques

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Introduction

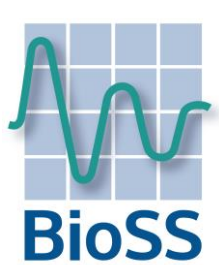
Phytophthora ramorum has caused substantial losses of Scottish forests in recent years due to widespread mortality of Japanese larch trees (*Larix kaempferi*). Infected trees are subject to statutory felling notices in an effort to reduce sporulation potential and aerial transmission. Nevertheless, there are concerns about the multiple pathways by which spores might be transferred to new sites.

In 2016 the Forestry Commission (now Scottish Forestry/Forestry Commission England) launched the Keep-it-Clean campaign. The campaign is aimed at forest users to minimise the movement of plant and soil material between forests to limit the spread of disease. People are encouraged to wash their wheels and boots when visiting the forest.

Along with recreational spread there are also concerns for the spread of material via commercial harvesting activities with a lot of activity focused on felling infected larch.

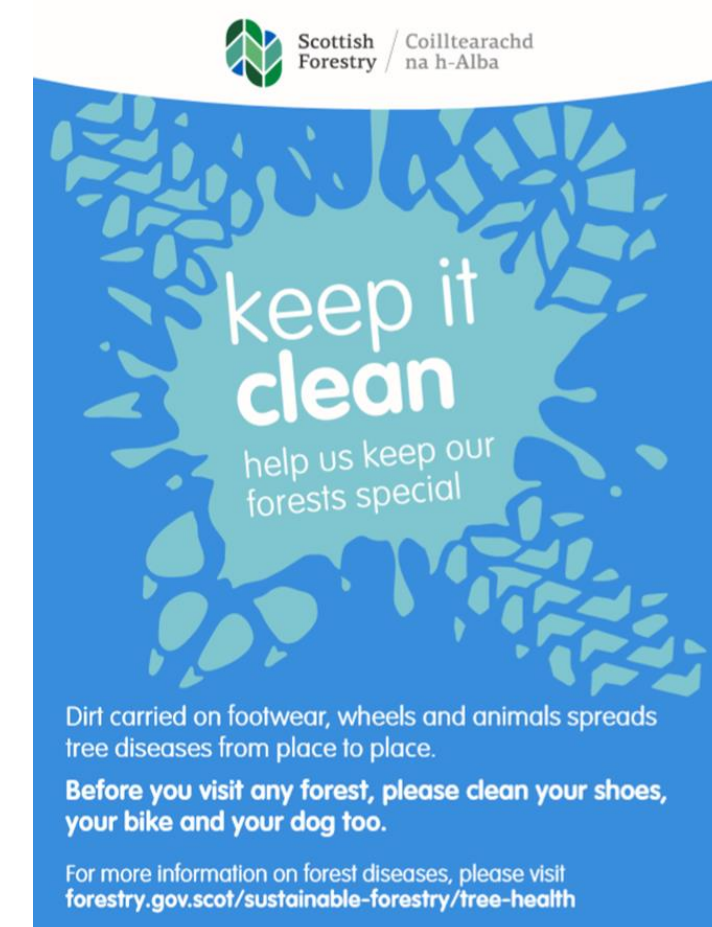
Acknowledgements

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Objectives

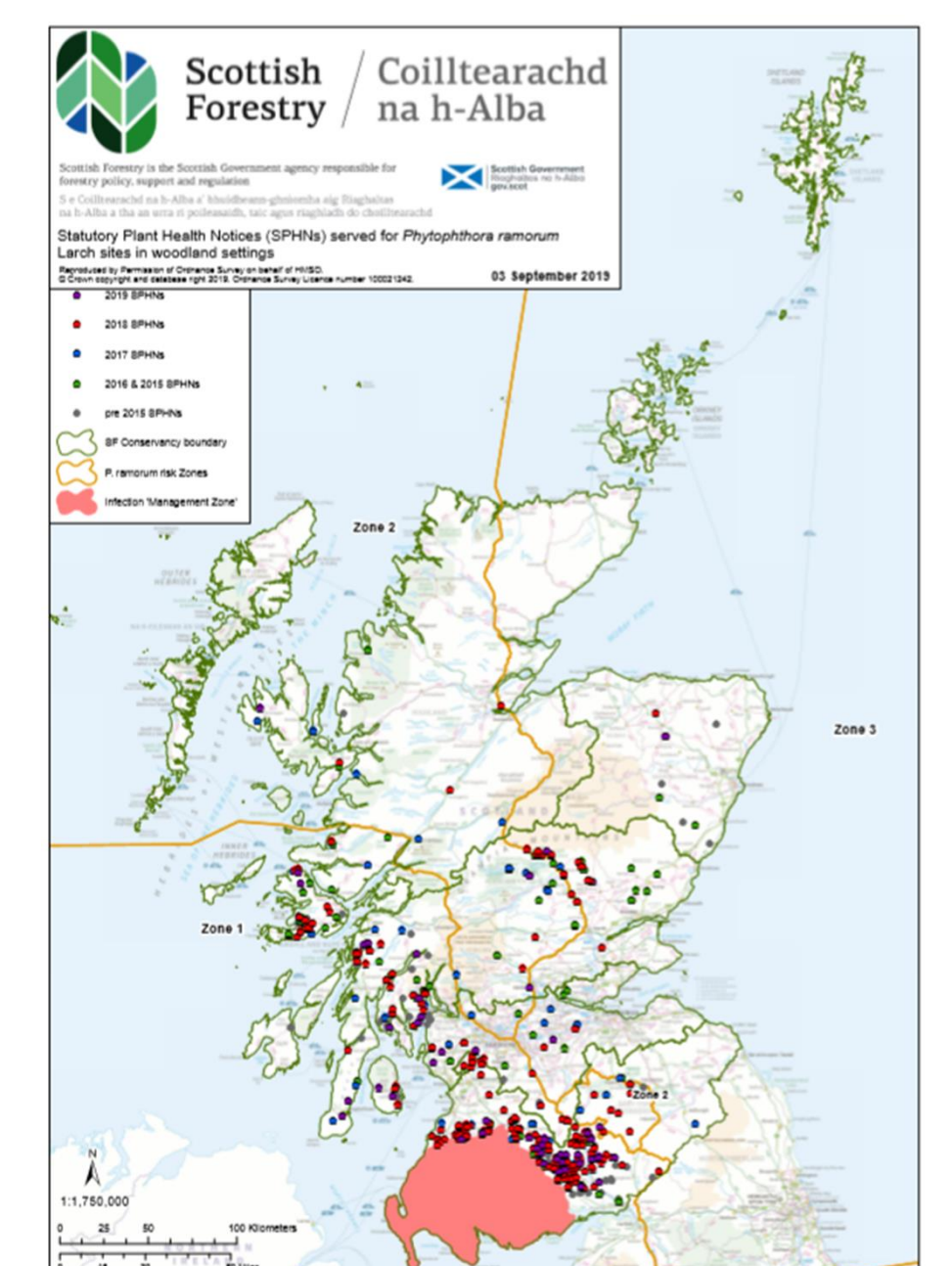
- Assess the potential for *Phytophthoras* to spread via soil and plant material moved by human activity providing evidence to support the Keep-it-Clean campaign.
- Provide a comparative study of qPCR and metabarcoding techniques for the detection of *Phytophthoras*, in particular *Phytophthora ramorum*.



Project outline

Assessment of leisure activities

- 3 sites surveyed across Scotland - all part of mountain bike trails which are also popular with walkers.
- 2 infected sites within the *P. ramorum* management zone, 1 previously uninfected site.
- Material sampled from bike and boot treads.



Harvesting/commercial activities

- 5 larch sites in *P. ramorum* management zone –material collected from forwarding and harvesting machines which have the potential to transport large amounts of material between sites.



Baiting, molecular detection and comparison of methods

- All samples described above were baited for the presence of *Phytophthoras*.
- *P. ramorum* was detected in all samples types (mountain bike/walking boots/harvesting machinery) using quantitative real-time PCR
- Samples are currently being analysed using Metabarcoding to assess *Phytophthora* diversity.
- This will allow a comparative study of qPCR and metabarcoding techniques for the detection of quarantine *Phytophthoras*.



Key messages

- There has been a significant increase in the number of non-native tree pests and diseases being introduced to the United Kingdom since the early 2000s.
- The movement of soil and plant material between forest sites has the potential to transport tree pathogens such as *Phytophthora spp.*
- Biosecurity is a growing concern in aiming to protect our forests.

