

# APPLICATION OF BIOSECURITY IN ARBORICULTURE

## GUIDANCE NOTE 2



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## Document Key:

Responsibility	Example Job Roles	Symbol
<b>Those undertaking practical operations</b>	Arborist, tree worker, groundsman, climber, team leader, foreman.	
<b>Arboricultural and tree planting contractors</b>	Owner, director, manager, supervisor.	
<b>Arboricultural and urban forestry advice</b>	Surveyor, consultant, designer, tree/arboricultural officer.	
<b>Managing tree population</b>	Arboricultural/tree/landscape/woodland officer, landowner, site manager.	
<b>Supplying to the arboricultural industry</b>	Tree nursery, equipment manufacturer.	
<b>Contributing to national, regional and local policy</b>	Policy advisor, politician, local authority employee, stakeholder group.	
<b>Procuring tree and arboricultural services</b>	Procurement manager/officer, site/facilities manager.	

The guidance set out within this document is of use to:

Each section uses symbols to show how relevant the content is to the person or company with the associated responsibility.

### Front cover images:

**Top:** *Thaumetopoea processionea* progressing through their life stages.

**Middle left:** Trees infected with *Ceratocystis platani*.

**Middle right:** Larvae of *Dryocosmus kuriphilus*.

**Bottom:** Fruiting body of *Hymenoscyphus fraxineus*.

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# Foreword and acknowledgements

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## Foreword

Trees have evolved alongside pests and pathogens, with many of those organisms being instrumental in nutrient recycling and the ageing process. Consideration of biosecurity, and the implementation of routine control measures such as cleaning pruning tools, will help to limit the introduction and spread of pests and pathogens. Some are potentially more devastating than others, and the threat of their arrival in a localised area or country warrants planning and preventative action.

The purpose of this guidance is to provide information to the arboricultural industries that will assist in efforts aimed at preventing a pest or pathogen outbreak which results in the accelerated mortality and loss of large numbers of trees – an outbreak as serious as Dutch elm disease, the ongoing spread of acute oak decline and ash dieback, or a hybridisation of *Phytophthora ramorum* or *Xylella*! The list goes on.

There is an increasing awareness amongst many tree owners and managers of the threats their trees are facing. Better understanding and an increase in knowledge amongst tree professionals is therefore required – and frequently expected – so that we can provide the public and our clients with up-to-date information and guidance on tree pests and pathogens and specify appropriate control measures.

The guiding principles and considerations outlined within this document are aimed at arboriculture and urban forestry. However, many of these considerations and principles are applicable to other sectors or trades such as plant supply, horticulture or forestry.

## Acknowledgements

As well as acknowledging this Guidance Note's principal authors, Simon Cox and James Roberts, the Arboricultural Association would like to acknowledge and give special thanks to Dr. Andrew Hiron who deserves great credit for outlining key principles to consider when building tree population resilience. The following individuals and organisations are also worthy of acknowledgement for their valuable assistance with the composition of, and consultation relating to, this document:

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# Context

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Over recent years the Arboricultural Association has worked to raise the issue of biosecurity, reflecting the concerns of its members. This formally began by documenting its position on the subject in the well-received and widely supported Biosecurity in Arboriculture and Urban Forestry Position Statement. Since then the Association's work on biosecurity has included:

- producing awareness-raising videos from key figures in the landscape industries and relevant government bodies;
- making biosecurity the main topic of its 2017 annual conference;
- raising the profile of pests and pathogens within its main publication, education and training channels;
- representing the industry on the matter to government and other industry groups;
- enhancing the Approved Contractor standard in relation to biosecurity for contractors and their operators; *and*
- resourcing industry with template documents and collating relevant biosecurity information for ease of access.

All of this is in addition to the excellent work of industry and Association members on the issue.

The logical next step is to supply this more detailed guidance on how individuals and organisations across arboriculture can look to achieve the principles and overarching aim of the Arboricultural Association's Biosecurity in Arboriculture and Urban Forestry Position Statement:

**The Arboricultural Association is committed to promoting the implementation and understanding of good biosecurity practices to assist in safeguarding the future of our trees from the introduction and spread of harmful organisms.**

1. Operatives and organisations undertaking work on or around trees should consider the reasonably foreseeable consequences of their activities. Adopting **biosecurity risk assessment** processes and **policy** commitments are prudent first steps.
2. Those undertaking work on or around trees have a responsibility to implement routine **biosecurity control measures** for all sites and specific measures for higher risk sites highlighted by the biosecurity risk assessment process. These should include the cleaning and disinfection of clothing, PPE, tools, equipment and vehicles.
3. Arboricultural operations such as pruning, felling and planting should be planned, managed and supervised to minimise the movement of arisings and soil. All arisings must be **appropriately disposed of**.
4. Organisations working on sites with trees should ensure that their operatives understand biosecurity issues and comply with adopted biosecurity measures. **Training, guidance and supervision** should be provided when necessary.
5. Anyone planning, designing, or implementing planting projects should aspire to source **home grown** and nursed specimens, avoiding where possible, directly imported stock to reduce the risk of introduction of pests and diseases.
6. Anyone responsible for tree supply should ensure that trees and associated soil are supplied to customers **free of pest and disease** at all points in the supply chain. Consideration must be given to the latency period and lifecycles of all pests and diseases in order to achieve this. Special attention must be given to imported stock.
7. Good urban forestry practice involves managing tree populations to **increase species and genetic diversity** by focusing on the establishment and maintenance of trees with qualities suited to the site and the prevailing climatic conditions. Additionally, good species composition, age structure, stock quality and condition will help reduce the future loss of trees due to the introduction, hybridisation or spread of tree pests and diseases.
8. Anyone involved with trees must encourage and promote adherence to these guiding principles and above all **act as role models** in this regard.



# 1

## Introduction



The advice in this guidance will help professionals to protect trees from pests and pathogens. The principles of how to prevent the introduction and spread of invasive species are fundamentally the same. Invasive species can often be unwittingly spread on equipment and within infested materials and have the potential to impact on entire ecosystems, terrestrial and aquatic, by outcompeting more favourable or native species for space and resources. The populations of many of these organisms can be very small to begin with, but if they become established they can grow far larger and go on to cause large-scale damage or nuisance.



The original definition of biosecurity started out as a set of preventative measures designed to reduce the risk of transmission of infectious diseases in crops and livestock, quarantined pests, invasive alien species, and living modified organisms (Koblentz, 2010).



Pests can **infest** and cause an infestation while pathogens can **infect** resulting in an infection. Both result in **contamination** of material such as plants and soil. **Introduction** is the first time a pest or pathogen arrives in a region or country, and **spread** is dispersal following introduction.

Biosecurity definitions and abbreviations are located in *Appendix 1*.

Human activity can accelerate the introduction, spread and establishment of tree pests and pathogens, which can have devastating consequences for tree populations in both urban and rural environments, their associated ecosystems and the multiple benefits that trees provide. Invertebrates (such as moths, beetles, wasps, nematodes and aphids), microorganisms (such as fungi, bacteria, viruses and phytoplasmas) and water moulds (such as *Phytophthora spp.*) all need to be considered as possible threats and, therefore, should be taken into account at the planning stage of arboricultural operations and urban forestry management. We can limit the introduction, establishment and spread of harmful pests and pathogens with good biosecurity practices.

As tree owners and managers seek advice on how best to protect their trees, it is understandable that they will also be looking for reassurance that the people they employ are taking adequate steps to prevent the unintentional introduction and spread of pests and pathogens.

This document aims to assist anyone involved with trees and arboriculture to:

- understand what biosecurity is and why it is important;
- understand the possible pathways for the introduction and spread of pests and pathogens;
- raise awareness of plant health law and government policy;
- incorporate biosecurity practices into work planning and business/organisation practice and management;
- adopt practical biosecurity control measures and planting practices to reduce the risk of introducing or spreading pests and pathogens;
- know when to report instances of ill health in trees, who to report to and what information to include; *and*
- know where to find the resources that are available to you.

For more information on invasive species visit the GB Non-Native Species Secretariat website:

[www.nonnativespecies.org](http://www.nonnativespecies.org)



# What is Biosecurity and Why is it Important?

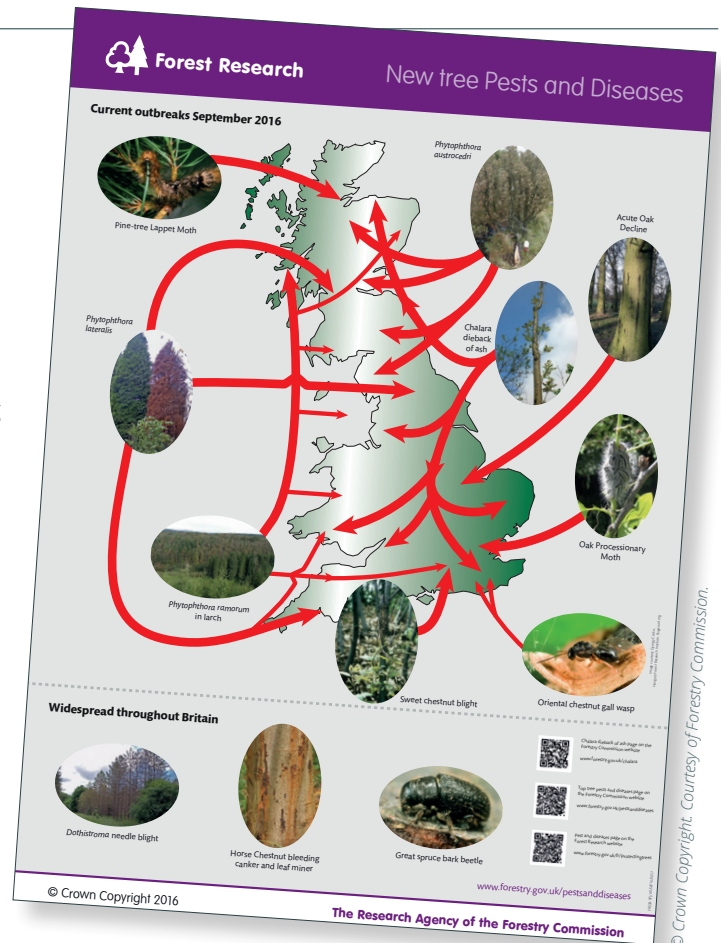
# 2

People working in the arboricultural industry are a particularly high risk group because:

- their work requires access and movement across multiple sites and tree stocks;
- they regularly transport and come into contact with materials that may carry pests and pathogens; *and*
- they are responsible for planting and establishing new trees that could carry pests and pathogens.

The increasing number of plants being imported provides opportunities for the accidental introduction of damaging pests and pathogens. Additionally, changing climatic conditions, such as drought and flooding, often place trees under stress. Stressed trees are more susceptible to attack from pests and pathogens. Changes in climate and associated warmer temperatures also mean that some pests and pathogens which would previously have been unable to establish can now gain a foothold if they are introduced.

Outbreaks of damaging pests and pathogens can have wide-ranging consequences as shown in *Table 1*.



In recent years we have seen an increase in the number of outbreaks (*Figure 1*) and a range of associated costs to the country. As an example, for oak processionary moth (*Thaumetopoea processionea*) Forestry Commission England budgeted approximately £1.2m for the financial year 2017/18 alone to control the pest across the 'Control Zone' and 'Protected Zone' (this includes visual surveying and the use of pheromone trapping, spraying and a communication programme). This does not include costs borne by tree owners.

Current information about the 'Control Zone' can be found at: [www.forestry.gov.uk/pdf/OPM\\_ZonesAsAtMay2018.pdf/](http://www.forestry.gov.uk/pdf/OPM_ZonesAsAtMay2018.pdf/)



The defoliating caterpillars of oak processionary moth (*Thaumetopoea processionea*) covered in long and short irritating hairs that can result in skin irritation and allergic reactions.

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## What is Biosecurity and Why is it Important?

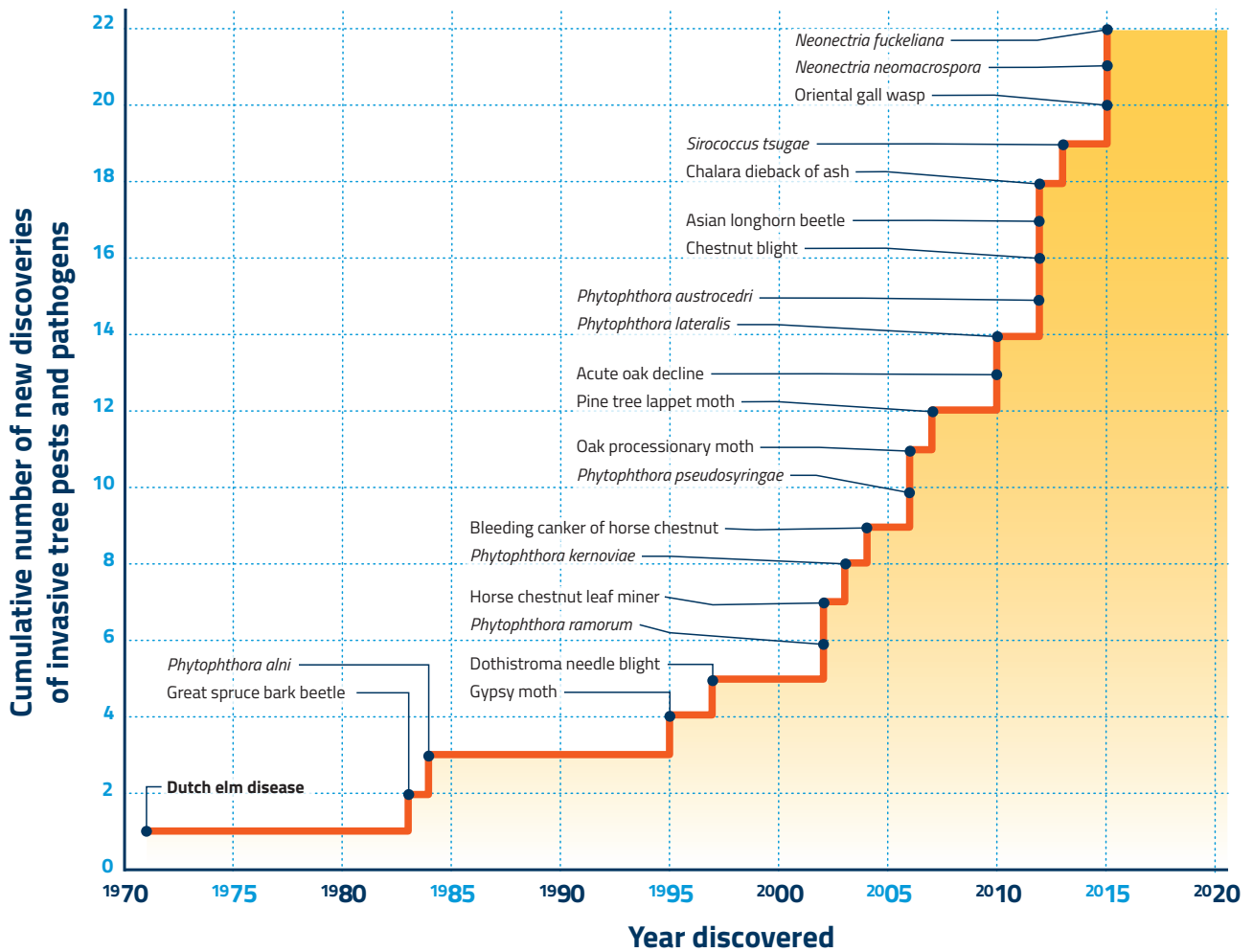


Figure 1: Indicating known findings of unwanted tree pests and pathogens in the UK since the 1970s (updated and compiled by J. Roberts based on the original work of Dr. J Webber).

Table 1: Consequences of damaging pest and pathogen outbreaks.

Consequence	Example Issues
<b>Economy</b>	<ul style="list-style-type: none"> <li>■ High cost of removal and replacement for local authorities and private landowners.</li> <li>■ Increase in costs for transport and disposal of material at specialist licensed waste-handling facilities.</li> <li>■ Increased costs associated with working practices and risk posed by a pest or pathogen.</li> <li>■ Loss of property value on streets where amenity trees have been removed.</li> <li>■ Increase in costs for climate control on streets where canopy cover is lost.</li> <li>■ Impacts on local recreation use, regional tourism and visitor economy.</li> </ul>
<b>Environment</b>	<ul style="list-style-type: none"> <li>■ Loss of wildlife habitats.</li> <li>■ Loss of veteran and ancient trees and their associated benefits.</li> <li>■ Loss of ecosystem services associated with trees such as: urban cooling, atmospheric particulate removal and the slowing of surface water run-off.</li> </ul>
<b>Society</b>	<ul style="list-style-type: none"> <li>■ Societal benefits of urban trees can be lost.</li> <li>■ Direct detrimental impact on human health.</li> <li>■ Loss of aesthetic value.</li> </ul>





# What is Biosecurity and Why is it Important?

# 2

## 2.1 Understanding pathways

Pests and pathogens can move from one site of infection or infestation to another in a variety of different ways by both man-made and natural actions at a local, regional and national level.

Initial introduction can result in a chain reaction of new outbreak sites. Human activity is a key factor in the spread of harmful organisms such as pests, pathogens and invasive species over longer distances and across borders, frequently via the horticultural and forestry plant trade.

Often these harmful organisms have propagules such as eggs, larvae or spores that are sometimes visible with the naked eye during thorough inspection, but frequently may be hidden or latent at the time of inspection. This is illustrated in *Figure 2*.

Arboricultural operations have the potential to move contaminated materials from one site to another on clothes, equipment and vehicles, as well as in live plants and through the transport of arboricultural arisings.

*Appendix 3* sets out a detailed pathways assessment of arboricultural operations and explains and identifies how arboricultural operations can lead to the spread of pests and pathogens, and provides examples of practical measures that can be taken to limit the risks. *Figure 3* provides a summary.

Arboricultural arisings, such as woodchip, brash, stump grindings, bark and timber, are a concern in relation to transmission of pests and pathogens (which can remain undetected within or on the arisings) as they are easily transported and stored.

A process for woodchip pasteurisation has been documented by Forestry Commission England ([www.forestry.gov.uk/forestry/infid-8scmu7](http://www.forestry.gov.uk/forestry/infid-8scmu7)).

The pasteurisation process reduces, and in some cases eliminates, pathogens using the heat generated by woodchip breaking down naturally when it is piled, just like a compost heap. This differs from sterilisation which works at high temperatures that cannot be generated by natural breakdown alone and results in the elimination of all pests and pathogens. An example of a custom-built and managed woodchip pasteurisation plant is at the Forestry Commission's Westonbirt Arboretum. This was designed and built after an outbreak of *Phytophthora ramorum*.

Additional detail is included in *Appendix 2: Biosecurity Risk Assessment* and *Appendix 3: Arboricultural Operations Pathway and Generic Biosecurity Risk Assessment*.



**Sweet chestnut blight (*Cryphonectria parasitica*) has a latency period of up to 18 months or more during which plants may be infected but show no symptoms, making detection and diagnosis difficult. Plants can harbour long-term beetle larvae, such as Asian longhorn beetle (*Anoplophora glabripennis*) with no obvious external symptoms until adults emerge 2–3 years later.**



**The Dutch elm disease epidemic in the 20th century is considered to have been exacerbated by the movement and inappropriate disposal of elm logs, whilst emerald ash borer (*Agrilus planipennis*) is being spread in firewood in North America.**

# 2 What is Biosecurity and Why is it Important?

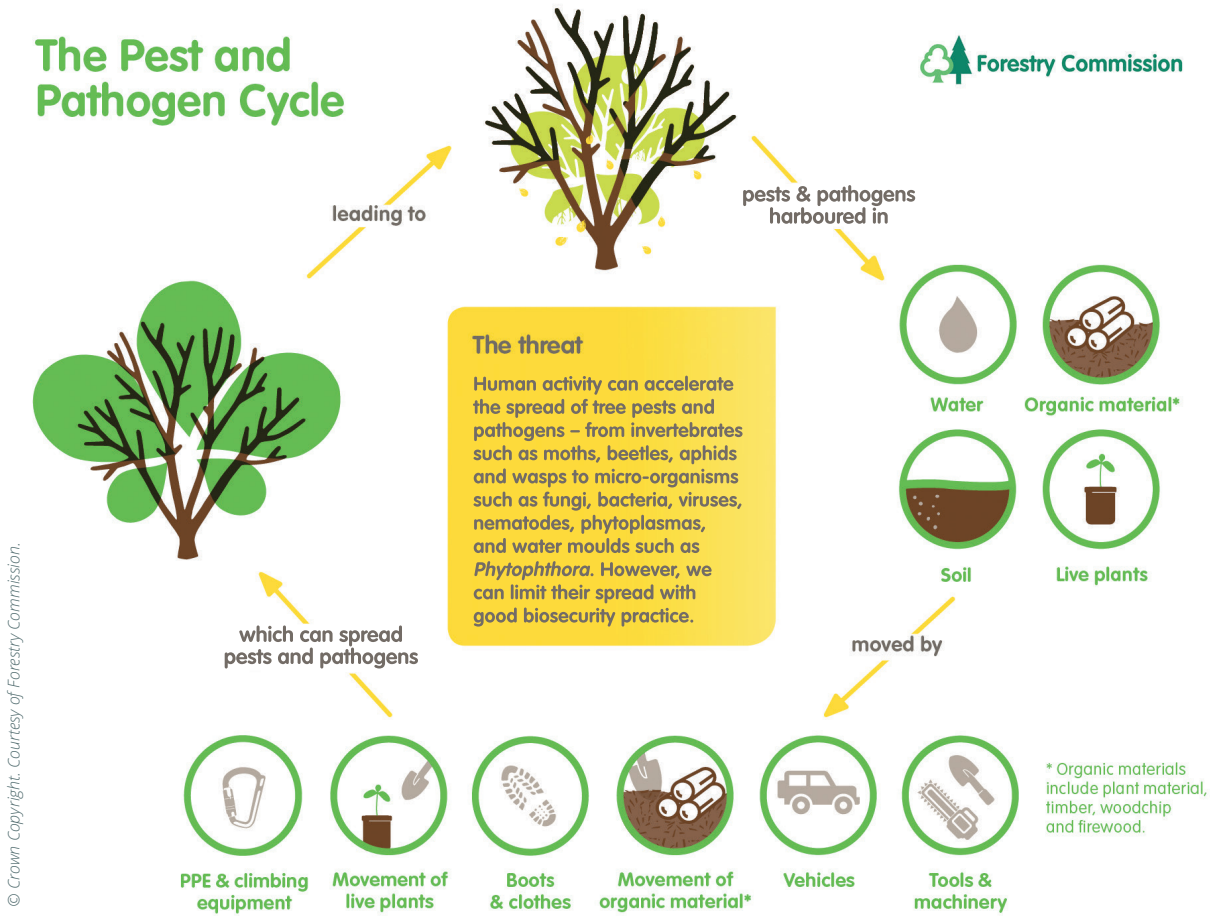


Figure 2: The pest and pathogen cycle – understanding pathways.



# What is Biosecurity and Why is it Important?

# 2

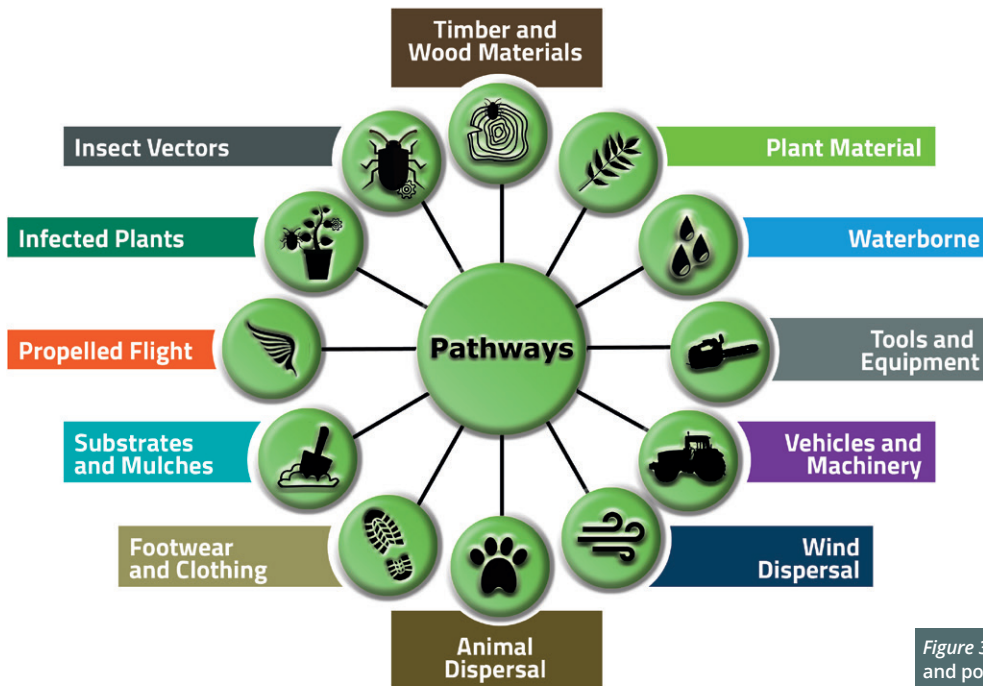


Figure 3: A snapshot of pathways and potential controls.

**Timber and Wood Materials**

Infected/infested material should remain on site. It may need to have bark removed and in some cases may have to be burnt.

**Plant Material**

Plant material can harbour pests and pathogens. Contaminated material should be burnt. Where this is not practical, the material should be composted or buried.

**Waterborne**

Waterborne pathogens are easily spread by people, equipment and machinery. Clean, disinfect and dry boots, tyres and tools.

**Tools and Equipment**

Pruning, climbing and other tools can spread pests and pathogens. Metal equipment should be disinfected between trees. Climbing equipment should be regularly washed.

**Vehicles and Materials**

All vehicles and machinery should be free of debris and visibly clean prior to arrival on site to avoid introduction of pests and pathogens.

**Wind Dispersal**

Avoid planting monocultures in order to develop a more resilient tree population.

**Animal Dispersal**

Make sure dogs and horses are cleaned between visits to woods and parks and keep to mud-free paths.

**Footwear and Clothing**

Personal hygiene is essential. Clean off all mud and organic material from clothes and boots and disinfect between sites.

**Substrates and Mulches**

Substrates and mulches can harbour pests and pathogens. Contaminated material should not be used as mulch or substrate.

**Propelled Flight**

Organisms with the capability of flight can spread quickly. Monitoring tree populations for early detection is key to effective control.

**Infected Plants**

New plants should have a plant passport or phytosanitary certificate as required and be subject to periods of quarantine or isolation to ensure they are free of pests and pathogens.

**Insect Vectors**

Insect vectors become difficult to control once established. Monitoring tree populations is vital for early detection and effective management.

# 2 What is Biosecurity and Why is it Important?

## 2.2 Routine biosecurity control measures

Arboricultural activities can be as simple as a surveyor with a notepad, pen and some handheld measuring equipment travelling from one site to another or as large scale as a site with multiple personnel, several work vehicles and machines. From the biosecurity pathways assessment (Figure 2, Figure 3 and Appendix 3), routine biosecurity control measures (Figure 4) have been identified to mitigate the risk of the accidental spread of pests and pathogens during any arboricultural operations.

**KEEP IT CLEAN**

**Think kit**

- Remove soil and debris from boots, clothing, ropes, saws and other equipment before leaving any site. Regularly wash and dry ropes.
- Clean and disinfect chainsaws and other cutting tools as part of routine maintenance.
- Ensure machinery is cleaned regularly and positioned so as not to spread material around the site.

**Think trees**

- Develop relationships with nurseries you can trust to help you source plants responsibly.
- Keep records of purchases and suppliers, and monitor plants for signs of ill health.
- Report suspect plants to the Forestry Commission via Tree Alert.

**Think transport**

- Remove any build-up of soil and debris on vehicles, including cabs and footwells, before leaving any site.
- Use proper off-site wash-down and disinfection facilities regularly. Make a clean start each day.

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Figure 4: Routine biosecurity control measures.

# What is Biosecurity and Why is it Important?

# 2



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A simple biosecurity kit should at least contain a bucket, hoof pick, water container and brush.

## 2.3 Basic biosecurity kit

An ideal biosecurity kit for routine biosecurity control measures should comprise:

- plastic storage box
- supply of clean water (5 litres)
- boot tray or bucket
- hard brush and boot-tread scraper
- vapour-proof container for disinfectant
- protective gloves
- eye protection
- brush, sponge or portable sprayer
- paper towels/wipes
- plastic bags and ties
- disinfectant

Suitable disinfectants are:

- Industrial methylated spirit and isopropyl (otherwise known as surgical spirit or rubbing alcohol) at concentrations above 70%, such as Propellar™ are suitable for disinfecting metals and recommended for *Phytophthora spp.* and for general purpose use.
- Cleankill® Sanitising Spray is suitable for disinfecting boots and outer wear. Recommended for *Phytophthora spp.* and general purpose use.
- Jet 5® and Hortisept Pro are recommended as general purpose disinfectants for boots and outer wear and for cleaning down areas such as propagation units.
- For specialised equipment such as tree climbing equipment/PPE, disinfectant should only be used as per the equipment manufacturer's guidance. Alternatively equipment should be designated for specific species/infected sites/pathogens. The routine control measures for specialised equipment are to wash and dry it on a regular basis such as between work sites.

Always undertake CoSHH (Control of Substances Hazardous to Health) risk assessments, follow control measures and make sure the substances do not run off into waterways.

**Disinfectants are only effective when applied to clean surfaces which are free of soil and organic material.** As a guide, spray disinfectant onto clean surfaces until it runs off.



# 2

## What is Biosecurity and Why is it Important?

### 2.4 Plant health law and policy – a short overview

The UK's Plant Health Service comprises Defra (Department for Environment, Food and Rural Affairs), including the Animal and Plant Health Agency (APHA) and the Forestry Commission (FC), and devolved administrations in Scotland, Wales and Northern Ireland, and includes representation from Crown Dependencies like Jersey, Guernsey and the Isle of Man. Additional information on the structure of the plant health services can be found in *Appendix 5*.



#### Instruments used to comply with the responsibilities of law include:

- **Plant passports:** In the EU Single Market, plant health checks are focused on the place of production. There are no border checks, but spot checks may take place anywhere in the trade chain. Material which hosts the most serious ('quarantine') pests and pathogens requires a plant passport to facilitate its movement. These are authorised by APHA or the FC in England and Wales and Northern Ireland's Department of Agriculture, Environment and Rural Affairs (DAERA), depending on the products. Scotland operates a non-standardised system with information appearing on delivery notes or other travel documents.
- **Phytosanitary certificate:** This is required for importation and exportation of many types of plant, plant products and seeds from third countries outside the European Union. Validity checks of the security measures embedded within the certificates, such as serial numbers, holograms or watermarks, are carried out at points of entry such as ports. They can only be signed for by registered inspectors of the exporting country. Soil is not included within this and requires a separate import licence.
- **Statutory Plant Health Notice (SPHN):** The relevant authority can issue a statutory notice detailing the actions to be taken to eradicate and contain pests and pathogens which may include:
  - removal and destruction of plants and trees
  - removal and destruction of plant debris and surrounding leaf litter
  - eradication of surrounding plants and trees to provide containment
  - removal and deep burial of soil associated with the pest, pathogen or plants
  - other measures including disinfection of items used on site

Defra and the devolved authorities implement a number of processes and procedures around plant health and biosecurity including:

- *The Plant Biosecurity Strategy for Great Britain* (PBSGB): Provides a high-level overview of the activity that Defra and the devolved administrations in Scotland and Wales are undertaking to improve plant biosecurity. The strategy has been developed in consultation with stakeholders and meets the recommendations of the *Independent Tree Health and Plant Biosecurity Expert Taskforce*. Scotland used the PBSGB as an overarching framework to set out the country-specific approach as detailed in the *Scottish Plant Health Strategy*. A similar strategy for Northern Ireland and the republic of Ireland is proposed.
- In 2018 England produced the *Tree Health Resilience Strategy* ([www.gov.uk/government/publications/tree-health-resilience-strategy-2018](http://www.gov.uk/government/publications/tree-health-resilience-strategy-2018)) which explains how the English government will work with others to protect England's tree population from pest and pathogen threats. This furthered the work of the *Tree Health Management Plan* which set out Defra's approach to tree health in England.
- Pest Risk Analysis (PRA) is a form of risk analysis considering biological, scientific and economic evidence conducted by regulatory plant health authorities such as Defra to identify the appropriate phytosanitary measures required to protect plant resources against new or emerging pests and regulated pests of plants or plant products ([planthealthportal.defra.gov.uk/pests-and-diseases/pest-risk-analyses/](http://planthealthportal.defra.gov.uk/pests-and-diseases/pest-risk-analyses/)). See the UK Plant Health Risk Register for further information and factsheets on the pests and pathogens of concern and many others ([secure.fera.defra.gov.uk/phiw/riskRegister](http://secure.fera.defra.gov.uk/phiw/riskRegister)).
- Contingency plans: Each country in the EU produces its own contingency plans in the event that a regulated pest or pathogen is introduced. For the United Kingdom this process involves consultation across all four countries to ensure a consistent approach to outbreak response. Each plan sets out the structures and systems used to coordinate an effective response within each country's jurisdiction based on the Pest Risk Analysis process. Be aware these plans are regularly reviewed so if you refer to them always check for an updated version. An example contingency plan for emerald ash borer (*Agrilus planipennis*) can be seen here: [www.forestry.gov.uk/pdf/Emerald\\_ash\\_borer\\_contingency\\_plan\\_January\\_2016.pdf](http://www.forestry.gov.uk/pdf/Emerald_ash_borer_contingency_plan_January_2016.pdf)
- A *Generic Contingency Plan for Plant and Bee Health in England* is also in place: [assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/593508/generic-contingency-plan-plant-bee-health-england.pdf](http://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/593508/generic-contingency-plan-plant-bee-health-england.pdf)



# Managing Tree Populations with Biosecurity in Mind

# 3

The realities of a pest or pathogen outbreak can be harsh. Measures required to manage an outbreak could include the deliberate, but necessary, removal of tree species or even the complete eradication of tree stock over a geographical area (known as sanitisation felling).

Pests and pathogens can have a lasting legacy if left undetected or allowed to spread. Any outbreak will require reactive management, with associated individual, organisational, economic, political and social costs.

This photograph shows the resources needed, and scale of interruption, to remove trees following an outbreak, in this case of oriental chestnut gall wasp (*Dryocosmus kuriphilus*).



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## 3.1 Responding to an outbreak

The front-line nature of an arborist's work means they are in an ideal position to spot outbreaks early. Taking action at the right time can be critical to managing an outbreak.

If a statutory-controlled quarantine pest or pathogen is suspected or confirmed there is a legal obligation to notify the finding to the relevant plant health authorities. These authorities will provide help and direction on the required action that must be undertaken.



A single adult Asian longhorn beetle (*Anoplophora glabripennis*) was discovered in a garden next to a stone importer's in Paddock Wood, Kent, in 2009. This single finding initiated an annual survey programme over the subsequent four years. In early 2012 a number of larvae were discovered in a willow tree close to the industrial unit. The larvae were confirmed as Asian longhorn beetle by DNA analysis which prompted a programme of eradication and further monitoring.

UK plant health authorities were required to survey to a distance of 2km and restrict all movement of wood, green waste and live plants within a 10km radius of the findings. In total 66 trees were found to be infested with Asian longhorn beetle. All infested trees and all potential host trees within 100m of infested trees had to be destroyed on site. The infestation area covered 11.5ha and a total of 2,229 trees were destroyed. No further findings have been discovered on the site to date. However, survey and monitoring of the site will continue until it is officially declared eradicated.



Cases of ill health found in trees across the UK should be reported through the Forestry Commission's Tree Pest and Pathogen sightings reporter (*TreeAlert*) which can be found at: [www.forestry.gov.uk/treealert](http://www.forestry.gov.uk/treealert)

Ireland and Northern Ireland use *TreeCheck* which can be found at: [www.treecheck.net/](http://www.treecheck.net/)

Alternatively, reports can be submitted to:

**England:** [tree\\_health\\_england@forestry.gsi.gov.uk](mailto:tree_health_england@forestry.gsi.gov.uk)

**Wales:** [treehealth@naturalresourceswales.gov.uk](mailto:treehealth@naturalresourceswales.gov.uk)

**Northern Ireland:** [planthealth@daera-ni.gov.uk](mailto:planthealth@daera-ni.gov.uk) or [afib.planthealth@dardni.gov.uk](mailto:afib.planthealth@dardni.gov.uk)

**Ireland:** [forestprotection@agriculture.gov.ie](mailto:forestprotection@agriculture.gov.ie) or [plantandpests@agriculture.gov.ie](mailto:plantandpests@agriculture.gov.ie)

**Scotland encourages the use of *TreeAlert*.**



# 3

## Managing Tree Populations with Biosecurity in Mind

In order to report a problem of ill health in a tree or trees you will need to record and submit the following information.

### Information about you and your observation:

- Your name.
- Valid email address.
- The date of your observation.
- A description of the location in which your observation was made.
- The location of the problem you are reporting, including the country, and either a grid reference (GR – a 10-figure GR is preferable, but a 6-figure GR is acceptable) or a point on a map. The ability to locate the affected tree or trees accurately is very important.
- The number of trees affected, their approximate size (measured as trunk/stem diameter).
- The type of tree affected (conifer or broadleaf), its common name and species.
- Information about the problem you have observed, including the location on the affected tree (crown, stem or base) and the nature of the symptoms.
- Photographs of your observation. Ideally, three good-quality photographs showing: (1) the affected tree(s) in context, (2) the problem/symptom in context, *and* (3) the detail of the symptom.

### 3.1.1 Targeted surveying and mapping

Where a pest or pathogen is discovered, a survey targeted on that species may be required to establish if other trees nearby are also affected. The responsible person should have sufficient knowledge of pests and pathogens and must understand when to seek support from, or notify, the relevant plant health authority.

A targeted survey will gather information that will inform a risk assessment and the management approach to the pest or pathogen. The survey should collect enough information to enable the mapping of:

- the distribution and impact of the pest or pathogen;
- the potential pathways of introduction and spread; *and*
- other non-affected vulnerable groups, blocks or individual trees nearby.

The timing of the survey is very important as different symptoms will be more visible at certain times of the year. For a guide on what symptoms to look out for and the most appropriate time to look for particular tree pests and pathogens see the Observatree pest and pathogen calendar: [www.observatree.org.uk/resources/](http://www.observatree.org.uk/resources/).

### 3.1.2 Management options

Site survey and mapping information should be used to undertake a risk assessment by evaluating the likelihood of the establishment and spread of the pest or pathogen and the potential impact of the outbreak. Defra's information on Pest Risk Analysis (explained in *Section 2.4*) is a useful starting point for risk assessments and cost-benefit analysis of options. Generally, the management options available fall under three categories:

- **Eradication:** Where a pest or pathogen is at an early stage of outbreak, in an isolated area or has only a limited spread, it may be possible to destroy the affected material or treat affected hosts in an attempt to eradicate the pest or pathogen. This action may require continued monitoring and enhanced biosecurity procedures on site for a number of years afterwards.





# Managing Tree Populations with Biosecurity in Mind

# 3

- **Containment:** Preventing the spread of the pest or pathogen to new unaffected areas is essential. Methods of containment may include the destruction of affected material on site or containerised movement of material to licensed waste-handling facilities; it may also involve enhanced biosecurity procedures.
- **Adaptation:** Where the cost-benefit analysis shows eradication or containment is not the preferred option, reducing the impacts of the pest or pathogen and adapting to it may be the preferred management option. Depending on the pest or pathogen, there may be options that can reduce the impact that it has on the tree population. This may involve improving the resilience within the population by introducing a more diverse range of species or genotypes and the introduction of tolerant or resistant species or varieties.

Effective management options for pest and pathogen outbreaks on site are likely to be a combination of these measures. More information on management options for specific pests and pathogens can be found on the Forestry Commission's pest and pathogen website pages: [www.forestry.gov.uk/pestsanddiseases](http://www.forestry.gov.uk/pestsanddiseases).

### 3.1.3 Contingency planning

Some organisations and landowners, such as local authorities, prepare emergency response (or contingency) plans for highlighted threats to an area or services under their control. Contingency planning looks to:

- Assess risk and identify actions required to mitigate this risk. The risk could be a pest or pathogen and actions could include tree population surveillance/inspections.
- Agree the respective roles of all parties and stakeholders involved in the response. These can be specific, for example the role of a business or service in dealing with a tree blocking a highway, or generic, such as the process of procurement for replacement planting stock.
- Put in place arrangements for 'business as usual' whilst the additional workload of the implemented emergency plan is undertaken.
- Arrange for information to be issued to the public, businesses and stakeholders as required.
- Identify and undertake any additional training required to implement the plan.
- Justify resource requirements (changes or additions).

These plans should then be regularly reviewed and altered accordingly. The key benefit of having a plan in place is that an organisation's reaction time to an issue is greatly reduced. The process of agreeing and communicating plans should also raise awareness amongst politicians and senior levels of management.

For tree-related pests and pathogens such emergency plans should be tailored to and expand upon national guidance such as Defra's Pest Risk Analysis and, for example, the FC's contingency plans.

At the time of going to print, the Tree Council is developing a 'Tactical Toolkit' to assist local authorities in planning for and developing a pest or pathogen emergency plan, based on ash dieback, to raise awareness of the threat and prepare for action and tree population recovery.



# 3

## Managing Tree Populations with Biosecurity in Mind

### 3.2 Educating tree owners

The majority of trees across the UK are located on privately owned land. It is therefore important that tree owners are made aware of their biosecurity responsibilities.

Those who administer and manage the development planning system in relation to trees (such as arboricultural/tree officers, landscape officers, woodland officers, planning officers and enforcement officers) and those who give arboricultural advice directly to tree owners (such as surveyors, contractors, consultants and tree/arboricultural officers) can play a crucial role in raising public awareness about biosecurity matters.

One way of raising awareness is through the planning system, making use of the existing lines of communication for Tree Preservation Order (TPO) and Conservation Area (CA) notices.

A local authority can recommend to private tree owners that they take appropriate steps in relation to tree work, planting and biosecurity by including 'Informatives' or 'Notes to Applicants' in correspondence such as decision notices. An informative is helpful advice which can be used to draw an applicant's attention to certain matters. An informative has no legal power; it is not mandatory to follow it and action cannot be taken for non-compliance.

The following text is an example of the wording that can be used:

1. When engaging contractors or arborists to work on your trees, you are advised to ensure that your chosen contractor recognises the importance of biosecurity in arboriculture and that they adhere to good industry practice as promoted by organisations such as the Arboricultural Association, the Forestry Commission and regional groups such as the London Tree Officers Association. Simple measures such as disinfecting equipment and appropriately disposing of arisings can help prevent the introduction and spread of pests and pathogens.
2. Biosecurity should be taken into account when planting trees. Your chosen planting stock should be free of pests and pathogens and sourced from a reputable nursery. Ideally trees will be UK grown and sourced. If they are imported from outside the UK, look to purchase trees that have been through a suitable quarantine or isolation period to demonstrate that no pests or pathogens are present prior to sale. Sourcing trees in a responsible manner can help to ensure your money is well spent and can reduce the need for expensive replanting.
3. Consideration should be given to building resilience in the local tree stock when selecting species for replanting/landscaping requirements. A resilient tree stock will help reduce the effects of our changing climate and pest or pathogen outbreaks. The chosen species should be suitable for the area and proposed location of planting. Do not use species considered invasive.

It may be possible to write these informatives into planning conditions, depending on the planning authority's own legal advice. Those in private practice could also use these informatives, or similar wording, within reports or advice to offer guidance to their clients.



# Managing Tree Populations with Biosecurity in Mind

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## 3.3 Local planning policy

Across the United Kingdom planning authorities provide a detailed framework for development to meet local and national planning policy needs and identify how land can be used and what will be built where. These are referred to as 'Local Development Plans' in Wales, Scotland and Northern Ireland, and 'Local Plans' in England. Once the plan is adopted by the authority, its requirements become the basis for assessing and deciding planning applications.

Biosecurity can be included within these plans. Here is an example:

- In relation to green infrastructure development proposals must **demonstrate** that they:
  - a) have been designed to use suitable species;
  - b) take account of the need for biosecurity, including control of non-native invasive species; *and*
  - c) ensure all planting stock is supplied free of pests or pathogens.

This requirement could be adapted for use in contract specifications or technical standards documents for the construction industry.

## 3.4 Incorporating biosecurity into business practice

Many organisations and companies working within arboriculture have documented policies and procedures which outline their commitment to health and safety or the protection of wildlife and the environment. Because of the serious consequences that arise from the introduction of damaging pests, pathogens and invasive species, it is recommended that a biosecurity policy is produced to demonstrate the organisation's commitment to protecting trees. The company should adopt the recommended level of biosecurity prescribed by plant health authorities such as the Forestry Commission or the Animal and Plant Health Agency (APHA). Larger organisations may also produce accompanying procedures.

A policy document should be succinct and easily understood by both internal and external audiences. It should read as a statement of intent which contains the key commitments that the organisation makes to protect trees from damaging organisms.

The policy should outline the company's commitment to:

- continued training and awareness of pests, pathogens and invasive species and biosecurity methods;
- undertaking site assessments to assess risk from tree pests, pathogens and invasive species (see *Appendix 2*);
- implementation of biosecurity control measures as part of arboricultural works;
- responsible sourcing of plant stock;
- responsible disposal of waste and arisings; *and*
- reporting of pests, pathogens and invasive species.

The document should also contain any current pest and pathogen issues relating to the area in which the organisation operates. For example, companies operating in OPM-affected areas should include a statement on the restrictions in place on the movement of live oak plants and the movement of oak arisings. This should make reference to good practice guidance, the relevant legislation and to the protection zones that are in place.

An example biosecurity policy is included in *Appendix 4*. Biosecurity risk assessment is explained in *Appendix 2*.



# 3

## Managing Tree Populations with Biosecurity in Mind

### 3.5 Technical and contract specifications

For larger organisations that procure services, an example technical specification in relation to biosecurity is set out below. All or part of it could be considered for use within a contract or specification document.

#### Example: Routine control measures and disinfection

The contractor shall meet the requirements stated in the British Standards Institution's *BS 3998: Tree Work – Recommendations* for 'Avoiding transmission of pests and pathogens'. In addition, all work equipment, including, but not limited to, machinery, uniform, PPE and vehicles, must be kept clean to minimise the transportation of soil, water and plant material between trees and work sites. Disinfection of equipment is to be considered part of routine maintenance. The contractor shall ensure that disinfection operations do not contaminate ground or watercourses.

#### Example: Biosecurity risk assessment including arisings

The contractor shall undertake a biosecurity risk assessment for each work site (this could form part of the site-specific risk assessment process) to determine any appropriate control measures to prevent the dispersal of pests or pathogens arising from all arboricultural works including tree planting. These control measures are to be agreed with the contract administrator and effectively actioned. These controls measures shall be at the contractor's expense and not treated as additional to the contract.

**Note:** For any higher risk work sites identified by biosecurity risk assessment or otherwise, such as those controlled by a Statutory Plant Health Notice, further guidance can be found at [www.forestry.gov.uk/biosecurity](http://www.forestry.gov.uk/biosecurity) and in the Arboricultural Association's Application of Biosecurity in Arboriculture.

#### Example: Planting and species selection

All planting species, planting stock size, establishment and maintenance requirements shall be selected with the aim of building resilience across the local tree stock. Invasive species must not be used.

To meet this requirement, criteria for consideration are to include:

- a) likely future local climate;
- b) current and threat pests and pathogens of tree species;
- c) planting density;
- d) structure of intended tree cover;
- e) planting positions and location, to ensure intended canopy cover can be achieved; *and*
- f) invasiveness of species.

Additional information to meet this requirement can be found in the Arboricultural Association's *Application of Biosecurity in Arboriculture* (Section 4 on 'Building Resilience into a Tree Population') and the British Standards Institution's *BS 8545: Trees: From Nursery to Independence in the Landscape*.



# Managing Tree Populations with Biosecurity in Mind

# 3

**Please note**, ideally, the use of these examples for sourcing planting stock should not replace the building of relationships with suppliers as outlined in *Section 5.1 'Responsible sourcing of plants and trees'*.

## Example: Sourcing planting stock

Tree planting stock is to be sourced from a nursery located in the UK and must be free of pests and pathogens. Plants will be UK grown or nursed for at least 12 months prior to sale.

Evidence to prove that these requirements have been met, and the origin of stock, will be available on demand.

Alteration to this requirement will only be accepted in exceptional circumstances in agreement with the contract administrator, providing suitable control measures to prevent the importation of pest and pathogens are evidenced.

**Note:** *Such evidence could include details and records of a pest and pathogen surveillance and control programme, and evidence that the supplying nursery has grown the trees for at least 12 months on its nursery prior to sale.*

## Example: Sourcing planting stock

Tree planting stock is to be sourced from a nursery located in the UK and must be free of pests and pathogens. Plants will be UK grown or nursed for at least one full growing season prior to sale.

Evidence to prove these requirements have been met, and the origin of stock, will be available on demand.

Alteration to this requirement will only be accepted in exceptional circumstances in agreement with the contract administrator, providing suitable control measures to prevent the importation of pest and pathogens are evidenced.

**Note:** *Such evidence could include details and records of a pest and pathogen surveillance and control programme, and evidence that the supplying nursery has grown the trees for at least one full growing season on its nursery prior to sale.*

## Example: Non-UK nurseries: sourcing planting stock

Tree planting stock is to be sourced from a reputable nursery and must be free of pests and pathogens. Plants will have been grown or nursed at the supplying nursery for at least one full growing season prior to sale.

If the reputable nursery is not located in the United Kingdom, evidence to prove these requirements have been met, and the origin of stock, will be available on demand, to include:

- a) suitable control measures to prevent the importation of pest and pathogens into the supplying nursery;
- b) details and records of a pest and pathogen control programme;
- c) evidence that the supplying nursery has grown the trees for at least one full growing season on its nursery prior to sale; *and*
- d) plant passport/phytosanitary certificate.



# 4

## Building Resilience into a Tree Population

This section is based on the 'Building resilience' chapter of the *Tree Health Resilience Strategy* (Defra, 2018) but it is tailored to the needs of arboriculture and urban forestry. Ideally, it should be read and used in conjunction with the *Tree Health Resilience Strategy*.

Predictions for climate change suggest that conditions for tree growth are likely to become even more challenging in many situations. Trees under stress are less able to perform key ecosystem services (e.g. cooling, improving air quality) and are more vulnerable to pests and pathogens. Therefore, the first principle of building a sustainable and resilient tree population, as shown in *Figure 5*, should be to *promote the health and vitality of existing trees*.

There is general agreement that increasing genetic diversity within the tree population will help increase its future resilience. This is based on the assumption that the greater the range of species and clonal cultivars (with genetic diversity within these species), the more likely that the health of fewer trees will be compromised by any single threat (such as a significant climatic event, pest or pathogen outbreak). Therefore, the second principle for building resilience into a tree population should be the *strategic diversification of the tree population*.

The term 'strategic' is particularly relevant because simply increasing the range of species planted is not sufficient to build resilience. For example, there are many species that will never be appropriate to plant in streets or courtyards; they do not have the traits or strategies required to cope with the conditions often associated with these locations. A diverse planting scheme has little value if it leads to high mortality rates during tree establishment. Diversification should be strategic in that it should expand the range of species and cultivars with long-term growth potential in a sustainable way. Furthermore, diversification is most valuable if it is achieved responsibly by procuring UK-grown, or nursed, trees raised from seed, and not by importing plant material from overseas or relying on clonal propagation methods. It is also critical that the biosecurity of UK trees is not jeopardised by diversity targets. Consider the guidance set out in *Section 5* if you are procuring trees that originate from abroad.

Studies on the diversity of current urban trees (e.g. *Trees in Towns II* and i-Tree projects) can justifiably present them as 'diverse' based on the number of species represented. However, these studies also indicate that whilst a broad range of species may be found in urban landscapes, a narrow range of dominant, large-crowned species provide the majority of the ecosystem services. Consequently, threats to a relatively few species disproportionately compromise the value of the urban forest as a whole. Indeed at the local scale (e.g. street or park), the potential loss of a single species may remove the vast majority of tree cover in that location. Since the provision of ecosystem services increases with tree size, *diversification should be strategic so that sites capable of supporting large specimens also support a diverse range of large species*.

Prescriptive quotas for diversity, such as the 10-20-30 rule (Santamour, 1990), are not always helpful as their application can fail to adequately consider the scale of the landscape being considered. It is the diversity at the landscape scale that is most important for building resilience within a tree population. Consequently, it is not necessary for every planting project to have the widest variety of species possible. For example, there are legitimate elements of urban landscape design that, for aesthetic effect, are more appropriately achieved with a narrow range of species. It may be that significant site constraints also limit the species pool from which to select. However, where design intentions or site constraints do not limit the range of species used, new planting should be as diverse as possible given the management objectives of the site. Indeed, the future resilience of a planting scheme is a meritorious design goal in itself. Vulnerabilities in a tree population come from plantings with a narrow range of species multiplied across a landscape. *Diversification should be strategic so that the planning and management of tree populations takes place at the largest scale possible*.



# Building Resilience into a Tree Population

# 4



Figure 5: Guiding principles for building resilience into a tree population.



# 4

## Building Resilience into a Tree Population

Where a diverse tree population has been identified it is vital that complacency is not allowed to suppress the pursuit of species diversity. Those responsible for tree populations must be forward-looking, in terms of both biosecurity threats and climate. Whilst diversity within the tree population should be a fundamental objective in tree population, urban forest and forest management, care must be taken to anticipate future threats. A diverse tree population is overwhelmingly positive, but some kinds of diversity are better than others. It is possible that a seemingly diverse tree population is more vulnerable to insects that have multiple hosts than a less diverse tree population made up of fewer susceptible species. For example, Asian longhorn beetle is a threat to many key genera used in UK urban landscapes (e.g. *Acer*, *Aesculus*, *Alnus*, *Betula*, *Carpinus*, *Corylus*, *Fagus*, *Fraxinus*, *Platanus*, *Populus*, *Prunus*, *Salix* and *Ulmus*), so it is possible to have a fairly diverse tree population that is still threatened by certain scenarios. *Diversification should be strategic so that future plantings are designed to extend species diversity beyond the known hosts of significant biotic threats.*

When selecting trees for new planting sites it is important to remember that trees have no foresight. They cannot anticipate the likely future stresses inherent in the planting location and they cannot anticipate the potential threat from pests and pathogens. As a result, consideration of such matters must be the responsibility of those tasked with selecting trees. Tree selection is, therefore, of strategic importance to building a resilient tree population and warrants attention within continuing professional development schemes. Selection of trees, urban and rural, can be assisted by the use of guidance such as:

- *Tree Selection for Green Infrastructure: A Guide for Specifiers*  
[www.tdag.org.uk/species-selection-for-green-infrastructure](http://www.tdag.org.uk/species-selection-for-green-infrastructure)
- Right Trees database – [www.righttrees4cc.org.uk](http://www.righttrees4cc.org.uk)
- UK Plant Health Risk Register – [secure.fera.defra.gov.uk/phiw/riskRegister/](http://secure.fera.defra.gov.uk/phiw/riskRegister/)

For rural/woodland plantings the Ecological Site Classification Decision Support System (ESC-DSS) can help forest managers and planners to select ecologically suited species for the site: [www.forestry.gov.uk/esc](http://www.forestry.gov.uk/esc).

Finally, *the strategic diversification of tree populations must be achieved in a sustainable way that does not compromise the biosecurity of the tree population by irresponsibly importing trees directly to site.* Those responsible for planting trees must follow good practice with regard to the procurement of trees and services (see Section 5) so that new pests and pathogens are not introduced into our tree populations as a consequence of well-intended goals for species diversity.





# The Trade in Plants and Trees

# 5

The nursery trade is very similar to sectors across many industries. A main distributor will likely have various suppliers within their supply chain. These can include seed suppliers, specialist species or variety growers, rootstock and propagation material suppliers, and soils and packaging suppliers. Due to the reactive nature of buyers and the time it takes to grow trees to recognised standards, those who procure trees can expect nurseries to intertrade and source trees from across the UK and Europe to meet orders from their clients.

There are various safeguards and checks in place at a national level that are designed to prevent infected or infested plants or plant material from arriving in the UK or to intercept them, as explained in *Section 2.4*. Unfortunately, given the vast numbers of imported live plants and their associated soil that arrive in the UK it is unrealistic to expect every host to be identified and inspected before, or on, arrival. Therefore, a risk-based approach has been developed to minimise the likelihood of introduction and spread.

Increasingly, regulatory quarantine measures are being legislated and have designated certain species as subject to specific plant health control measures such as containment, eradication, restricted movement, plant passports, etc. Industry-led accreditation schemes relevant to tree growers are beginning to spread, such as the Woodland Trust's UK Sourced and Grown schemes and the Horticultural Trades Association's Plant Health Assurance Scheme (PHAS). Such schemes can help provide reassurance to the buyer about a nursery's practice in relation to each scheme's requirements, which may include periods of isolation or quarantine. However, as tree buyers you should not rely solely on such certifications but should complement their use by providing nurseries with specifications for stock, by visiting the nursery and enquiring about its practice, by choosing your own stock and by checking stock on delivery for signs of pests and pathogens and quality.

Additionally, a number of growers and nurseries are adopting biosecurity policies and site isolation and quarantine measures, such as general hygiene, holding areas for incoming plants and inspecting plants on receipt, as well as continuing to ensure good levels of general practice such as plant husbandry and water and waste management. The International Plant Sentinel Network and the National Trust have released guidance on biosecurity, quarantine and isolation in relation to botanical gardens and arboreta. This is equally applicable to small- and larger-scale growers and nurseries and supports the nursery-specific guidance and practice stated in *BS 8545:2014 Trees: From Nursery to Independence in the Landscape – Recommendations*.

International Plant Sentinel Network – Guide to plant biosecurity in botanic gardens and arboreta

[www.plantnetwork.org/links/plant-health-links/national-trust-plant-quarantine-biosecurity-guidance-notes/](http://www.plantnetwork.org/links/plant-health-links/national-trust-plant-quarantine-biosecurity-guidance-notes/)



**The trade in live plants has been implicated in a large number of introductions of serious tree pathogens and pests both in the UK and worldwide. For example:**

- *Phytophthora ramorum* was introduced to the south-west of England on infected nursery stock from which it spread to larch forests throughout the west coast of the UK.
- Chalara dieback of ash (*Hymenoscyphus fraxineus*) is thought to have been introduced in planting stock from Eastern Europe and carried to new sites across the UK, along with infected ash planting material.
- Oak processionary moth (*Thaumetopoea processionea*) was introduced to south-west London on instant-impact trees brought in from Holland.



# 5

## The Trade in Plants and Trees

### 5.1 Responsible sourcing of plants and trees

Those working in arboriculture can help by sourcing tree and plant stock from reputable suppliers that have invested in good biosecurity and phytosanitary procedures. It is important to understand relevant regulations that surround the importation of plants, to know the chain of custody that your trees have been through and to be vigilant in the inspection and record-keeping of new planting.

Practical tree sourcing and procurement measures should aim to source the lowest risk plants in relation to pest and pathogen introduction and spread as is reasonable and practically possible, based on informed species selection, consideration of site and planting locations, and density of planting as detailed in *Section 4*. Items for consideration during sourcing of stock include: (1) origin of stock, (2) size of stock, and (3) phytosanitary measures.

#### 5.1.1 Planning ahead

Aim to source trees locally and seek trees that have been propagated and produced in the UK. These trees are likely to be better acclimatised to local conditions. Alternatively, consider contract-grown or contract-finished stock. Contract-grown (mainly applies to hedge and woodland planting) and contract-finished (which is the finishing of larger stock in the UK over a number of years – this could include containerising rootballed stock) trees give the buyer more control over the end product and give the supplier greater opportunity to provide the product you want. You might stipulate that you want trees that have not been sprayed with a *Phytophthora* fungicide as it may hide symptoms of infection, that the trees are UK grown or that imported trees have been quarantined for a period before leaving the nursery. In essence, contract growing and finishing give the buyer control over what is being purchased.

Smaller plants allow easier inspection while larger plants, and their often substantial rootballs, are much harder to inspect for the presence of a damaging tree pest or pathogen. Many UK nurseries supply larger trees. If instant-impact trees, which represent the greatest biosecurity risk, are necessary, source from UK-grown material or from a UK nursery that has appropriately considered a period of quarantine or suitable controls.

**Write a specification of exactly what you want. Don't be afraid to stipulate that you want trees from a particular source, origin or seed stock. Any good supplier will be able to accommodate this.**

#### 5.1.2 Develop supplier relationships

Source plants from nurseries with a good track record that make available information demonstrating the supply of healthy trees. Don't be afraid to ask questions: a good supplier will welcome questions and be happy that you are interested. It is prudent to:

- Request a profile of the company. This should include a brief history of the business, highlight responsible people within the business, detail any accreditations or memberships the business holds and list any supplier the business uses within its supply chain.
- Ask for a copy of their biosecurity policy and be prepared to follow up on any queries or supporting evidence you require.
- Ask for a copy of a quality control policy/procedure and be prepared to follow up on any queries or supporting evidence you require. Key information should include the supplier's ability to trace and audit individual trees within their supply chain and beyond into the landscape.
- Enquire about the credentials and competency of the person ultimately responsible for the supply of the trees, such as the owner or manager. A copy of a CV would be suitable.
- If a certification scheme applies, request a copy of the company's registration.
- Ask for a few references from customers similar to you, e.g. commercial, residential etc.



# The Trade in Plants and Trees

# 5

Aim to visit the nursery to assure yourself, and in turn your clients or partners, of good biosecurity and production standards. Have a list of pre-prepared questions to ask regarding tree health, traceability and origin of stock, and biosecurity. For example:

- Ask where they source their trees, planting mediums, propagation material and rootstocks, with the aim of understanding the entire pathway from seed/cutting to finished plant. If the trees or material is imported, enquire about countries (and regions for larger countries) of origin and duration held. Request evidence of when those trees were delivered into the UK.
- Ask about propagation methods especially for budded or grafted stock. A general rule is rootstocks should be from the same species (e.g. *Cornus kousa* would be used as the rootstock for a budded or grafted variety such as *Cornus kousa* 'Milky Way').
- Ask about the pest and pathogen control and surveillance measures that they employ.
- Ask them to evidence use of the control measures.
- Find out if they have experienced outbreaks of pests and pathogens and if so how these were resolved.
- Enquire about their last inspection by plant health inspectors and any findings.
- Check if the nursery has in place any additional measures to ensure good tree health such as indicators of physiological performance.

Additional guidance is available in the National Trust's quarantine and biosecurity guidance

Note 1 – Sourcing Plants: [www.plantnetwork.org/links/plant-health-links/national-trust-plant-quarantine-biosecurity-guidance-notes/](http://www.plantnetwork.org/links/plant-health-links/national-trust-plant-quarantine-biosecurity-guidance-notes/)

### 5.1.3 Choose the trees yourself

When you have settled on a supplier, visit the nursery again and tag the trees yourself so you are assured of getting the exact ones you have chosen. If you cannot be shown the trees you require then ask why they are not available to view. It could be that these trees will be imported to complete an order.

Check that the trees have the correct official documentation. The movement or importation of some species may be prohibited. Others may require a plant passport. Certain tree species imported from outside the EU may require a phytosanitary certificate. There is no single template used for a plant passport, but it must include the following details:

1. The phrase 'EU Plant Passport'.
2. 'UK' to show that the plants were grown in or imported into the UK.  
'IRL' to show that the plants were grown in or imported into Ireland.
3. Additional codes will be shown; 'EW' for England and Wales, 'S' for Scotland, 'NI' for Northern Ireland. For Ireland the code 'IE' may also appear.
4. A unique registration number from the country's relevant responsible body (APHA, DAERA, DAFF, etc.) and indication of that body.
5. An individual serial, week, batch or invoice number.
6. The botanical name of the plant or plants.
7. The quantity in the consignment.
8. The letters 'ZP' and a protected zone code if you are moving consignments in EU protected zones.
9. The letters 'RP' if it is a replacement plant passport.
10. The country of origin of the consignment if it originally came from a non-EU country.

When ordering, confirm a unique identifier, the species, size and production method for each tree you intend to buy for your own record-keeping and for traceability.



# 5

## The Trade in Plants and Trees

### 5.1.4 Check your plants on delivery and during aftercare

- In addition to other checks, make sure plants look vigorous and healthy, and reject any that show symptoms of ill health, pests or pathogen. If you suspect a notifiable organism is present then report this through Tree Alert or Tree Check as relevant (see *Section 3.1*) or contact local plant health inspectors.
- Ensure you have been given the correct documentation for the trees/batch for your own records.
- Regularly check any new plantings for signs of ill health, pests and pathogens.

The nursery should be able to demonstrate chain of custody through the supply chain, such as being able to identify trees from the same batch which may have been distributed across the UK in case they need to be recalled or destroyed because of a problem.

Those assisting in the design, implementation, management or contracting of the planting project should keep their own auditable records.

Keep accurate records including:

- plant passport/phytosanitary certificate details;
- supplier;
- date of purchase;
- previous treatments undertaken, e.g. fumigation or *Phytophthora* fungicide; and
- where and when the trees were planted out.

**This information can greatly assist plant health authorities in the event of an outbreak of a serious pest or pathogen.**

If a buyer is directly importing trees they should be aware of the requirement to notify the Plant Health Authority of the consignment using the EU Plant and Tree Notification System. Additional information can be found at: [www.gov.uk/guidance/importing-trees-and-plants-to-england-and-wales-from-the-eu#eu-plant-and-tree-notification-system](http://www.gov.uk/guidance/importing-trees-and-plants-to-england-and-wales-from-the-eu#eu-plant-and-tree-notification-system)



# Biosecurity Definitions and Abbreviations

# 1

**APHA:** Animal and Plant Health Agency. Plant Health Seeds Inspectorate (PHSI) is part of this agency.

**Biosecurity:** A set of precautions that aims to prevent the introduction and spread of harmful organisms. These may be pests, pathogens or invasive species.

**Biosecurity control measures:** Practical steps designed to minimise the risk of introducing or spreading pests, pathogens and invasive species.

**Biosecurity policy:** A set of guidelines produced by a company which outlines a commitment to incorporate biosecurity practices throughout the company's operation.

**Biosecurity risk assessment:** A careful examination of what, in your work, could inadvertently introduce or spread pests, pathogens or invasive species, and identification of steps which could reduce the risk of this occurring.

**CA:** Conservation Area.

**CoSHH:** Control of Substances Hazardous to Health, under the Control of Substances Hazardous to Health Regulations 2002.

**CPD:** Continuing Professional Development.

**DAERA:** Department of Agriculture, Environment and Rural Affairs (Northern Ireland).

**Defra:** Department for Environment, Food and Rural Affairs.

**Ecosystem services:** A wide array of benefits to society from trees including timber, wildlife habitat, creating places for relaxation or recreation, flood mitigation and carbon sequestration.

**ESC-DSS:** Ecological Site Classification Decision Support System.

**FC:** Forestry Commission.

**FR:** Forestry Research.

**GR:** Grid reference.

**Introduction:** Entry of an organism resulting in its establishment.

**Invasive species:** An introduced species of plant, fungus or animal which is not native to that location and which has the potential to cause damage to the environment, economy or human health.

**IPPC:** International Plant Protection Convention.

**Isolation:** Methods to prevent the movement of contaminated plants and plant products. *Also, see Quarantine.*

**ISPM:** International Standards for Phytosanitary Measures.

**Latency period:** A period of time where a plant may be infected or infested by a particular pathogen or pest but where there are no physical symptoms that indicate ill health.

**Non-quarantine pest:** A pest that is not a quarantine pest for an area.

**NPPO:** National Plant Protection Organisation with responsibility for quarantine lists, pest risk analysis and phytosanitary controls. These report to a Regional Plant Protection Organisation (RPPO), who in turn report to the International Plant Protection Convention (IPPC) which is overseen by the Food and Agriculture Organisation (FAO), a specialised agency of the United Nations (UN). For the UK the NPPO is Defra (see Defra) and the RPPO is the European and Mediterranean Plant Protection Organisation (EPPO).

**NRW:** Natural Resources Wales.

**OPM:** Oak processionary moth.

**Organism:** Any individual entity that exhibits the properties of life.

**Pathogens:** Organisms such as bacteria, fungi and viruses that cause diseases.

**Pathways:** The routes by which a pest or pathogen can be spread and introduced to new sites.

**PBSGB:** Plant Biosecurity Strategy for Great Britain.

**Pests:** Organisms that are destructive or harmful to trees such as invertebrates or other animals.

**PHAS:** Horticultural Trades Association's Plant Health Assurance Scheme.

**Phytosanitary:** Controls that relate to the international trade of plants and plant products.

**PRA:** Pest Risk Analysis.

**Propagules:** Any part of an organism (plant, pest or pathogen) that could give rise to a new individual, such as seeds, spores, eggs, larvae or adults.

**Protected zone:** An EU country may request special protection for all or part of its territory from harmful organisms (listed in *Directive 2000/29/EC*) when the harmful organism is not present in that area despite the environmental conditions in the protected zone being favourable for its establishment. Each protected zone is defined in relation to a particular harmful organism. The relevant EU country must ensure that the harmful organisms remain absent from the protected zones by following appropriate EU measures and carrying out annual surveys.

**Quarantine (or a status of quarantine):**

This is applied across the trade and use of plants and means the isolation (physical or other effective means) of plants while tests or checks are performed to detect the presence of a problem, pest or pathogen. Various additional measures may also be in place such as plant passports or fumigation.

**Quarantine organism:** A damaging pest or pathogen which is not present in a particular area or if it is present, is not widely distributed and is being officially controlled.

**SASA:** Scottish Agricultural Science Agency.

**SPHN:** Statutory Plant Health Notice.

**SPHS:** Scottish Plant Health Service.

**TPO:** Tree Preservation Order.



# 2

## Biosecurity Risk Assessment

There are some cases where you may need to be more rigorous with your biosecurity practice than just routine control measures, such as:

- if you have been informed there is a pathogen or pest present;
- you have found a pathogen or pest present;
- there is an existing Statutory Plant Health Notice in place; *or*
- you are working within the vicinity of an infected/infested tree(s).

If you are operating in an area that has a known outbreak of a tree pest or pathogen (or invasive species), there is likely to be specific advice relating to its management. **Specific advice will take precedence over the generic advice in this guidance note.**

To ensure that biosecurity procedures are adopted it is important that they are both proportionate and relevant to the type and scale of the work being undertaken.

Biosecurity should be considered as part of any standard operating procedure involving tree work and should form part of a risk assessment and potentially a method statement process. The easiest way to achieve this is to include an assessment of biosecurity and any associated risks within a normal site risk assessment process prior to and at the point of work. This is referred to as a **biosecurity risk assessment**.

Anyone undertaking a biosecurity risk assessment should:

- have an up-to-date overview of threat pests and pathogens;
- be able to recognise symptoms of damage from pests and pathogens;
- understand the legislative framework;
- understand where to seek additional advice from organisations such as the Forestry Commission, APHA, or Observatree's website, or specific field guides and books;
- understand the procedure for taking samples and where to send them for analysis. Note that additional costs may be involved. (See [www.observatree.org.uk/wp-content/uploads/2015/10/Observatree-sampling-guide.pdf](http://www.observatree.org.uk/wp-content/uploads/2015/10/Observatree-sampling-guide.pdf));
- know how to report a suspected or confirmed case of a pest or a pathogen;
- appreciate and understand the application of a range of biosecurity control measures and their application; *and*
- know their own limitations and when to seek help.

A sensible approach to a biosecurity risk assessment is to first ask yourself the question **Is a pest and/or pathogen of concern present or suspected on or adjacent to the site?**

In answering this question consider the following:

1st: **The trees on site:**

- Species: are they hosts of high risk pests and pathogens?
- Is the landowner/manager concerned that a damaging pest and/or pathogen is on site?
- Is a Statutory Plant Health Notice in place? Ask the owner/manager of the land. Check with the relevant plant health authorities if you are concerned.
- How many trees are exposed/subjected to the pest and/or pathogen?
- Know your local area and any restrictions in place, an example being the oak processionary moth 'Protected Zone' in the south-east of England and published distribution maps.



# Biosecurity Risk Assessment

# 2

2nd: **Check for signs and symptoms of ill health in trees that could be associated with a pest or pathogen as highlighted in Table 2.**

If you do not identify a possible pest and/or pathogen or opportunity for **introduction**, end your biosecurity risk assessment but **always** undertake routine biosecurity control measures.

Be aware that a biosecurity risk assessment is not designed to recommend actions or treatments required to control or eradicate a pest and/or pathogen. These should be driven by additional guidance or a Statutory Plant Health Notice. Conducting the biosecurity risk assessment is about identifying a problem and stopping yourself or your organisation from spreading the problem. Information regarding the management of a pest or pathogen outbreak is located in *Section 3.1*.

**Table 2: Some common symptoms and signs of ill health in trees. Photographic examples overleaf.**

Type of pest or pathogen	Symptoms/signs
<b>Leaf chewing beetles and mites</b>	Jagged, scalloped or ripped leaf edges, reduced leaf area, distortion, dieback, and defoliation.
<b>Stem borers</b>	Stem borers are grubs or caterpillars (beetle or moth larvae) that tunnel through and feed on wood, causing damage to twigs, branches, stems and trunks. Frass and sawdust can be found on or around the tree, as well as holes in the tree. The holes are normally round or D-shaped and from a few millimetres to 10mm wide.
<b>Leaf miners</b>	Feeding may lead to dried, silvery or brown leaf tissue. Leaves can be shed early and leading shoots distorted, causing lateral branching. Severe infestation can cause defoliation.
<b>Sap-sucking insects</b>	Leaf discolouration, withering or, in severe infestations, leaf loss.
<b>Fungal, bacterial and viral pathogens</b>	Defoliation and dieback. Leaf symptoms include spots, blotches, blisters, rusts, mildew and changes in colour (discolouration). Stem and branch symptoms include dying patches, bark stains, cracks and splits (sometimes with leaking sap) and sheets of fungal mycelium (dense strands of fungal threads) under bark, as well as fungal fruiting bodies of various shapes and sizes.

In the event that you highlight a higher risk site, consider the following:

1. Identify what is causing the signs and symptoms.
2. Should this species be reported to the relevant body? If so, see *Section 3.1* for advice on reporting ill health in trees.
3. Familiarise yourselves with its lifecycle and pathways for spread.
  - Is it active or inactive?
  - What stage of its lifecycle is it in?
4. What impact would arboricultural work have on the site?
  - Assess the pathways. Use *Appendix 3* to help.
  - Ensure you consider movement of material and waste.
5. Identify what control measures are required to limit the spread of the pest or pathogen as part of your proposed work (bear in mind that specific guidance may already exist for responding to the pest or pathogen).

# 2 Biosecurity Risk Assessment

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Diamond-shape discolouration on a stem typical of Chalara dieback of ash (*Hymenoscyphus fraxineus*).

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D-shaped beetle exit hole associated with acute oak decline.

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Abnormal growths, called galls, of oriental chestnut gall wasp (*Dryocosmus kuriphilus*).

© Crown Copyright. Courtesy of Forestry Commission.



Necrosis caused by *Phytophthora cambivora* infection of the plant's stem.

© Courtesy of D. Slater



Bleeds, sometimes referred to as 'inking', typical of *Phytophthora* infection.





# Biosecurity Risk Assessment

# 2

For sites identified as higher risk, a biosecurity plan should be compiled from the information collated during the initial biosecurity risk assessment process (this could also be referred to as a method statement). This may be a stand-alone document or could be incorporated into other company documentation. Biosecurity plans and method statements should be communicated to all relevant parties and include standard information such as the personnel involved, emergency contingencies, competencies, CoSHH information etc., but specifically in relation to biosecurity they should contain:

- site/extent/plan
- host species
- confirmed/possible pest or pathogen, lifecycle information and pathways
- symptoms/damage
- work required and identification of trees
- overall aim of the works, e.g. eradication, containment, minimising impact
- biosecurity controls for clothing, PPE, tools, equipment, machinery and vehicles
- timing of works
- disposal of arisings
- contact details for reporting further pest and pathogen issues

Having assessed the risks as required, ensure each task is appropriately resourced (funding, time, skills, equipment/materials, supervision) to ensure control measures are effectively implemented.

Below are four example biosecurity risk assessments with suitable control measures for higher risk sites. In each case some background information is included and an example is provided of how the significant information and findings can be recorded as a risk assessment.

## Scenario 1: Oak situated in oak processionary moth outbreak area

### Background

Your company has been called in to undertake pruning of a roadside oak. The tree is situated within the oak processionary moth (*Thaumetopoea processionea*) outbreak area ([www.forestry.gov.uk/oakprocessionarymoth#outbreak%20stage](http://www.forestry.gov.uk/oakprocessionarymoth#outbreak%20stage)). The tree has not been identified as an infested tree. However, caution is important as a visual inspection does not always identify the pest, particularly at the egg plaque stage.

It is an offence to introduce or spread this pest to protected zone areas of the UK.

Egg plaques can be difficult to see on oak material, chipping material is not a guaranteed method of the destruction of the pest. All oak material in affected areas should be treated as potentially infested. All findings of OPM should be reported through the Tree Alert reporting tool.

No oak material under 10cm diameter should be transported into the protected zone: see [www.forestry.gov.uk/oakprocessionarymoth](http://www.forestry.gov.uk/oakprocessionarymoth). Oak arisings from within affected areas should be either left on site or incinerated at a licensed waste-handling facility. OPM poses a health risk to humans and animals so the appropriate PPE should be provided to all operators on site.

### Example risk assessment

*Is a pest and/or pathogen of concern present or suspected on or adjacent to the site?*

Yes/No

*How does this affect your work?*

- Health hazard to workers
- Legal compliance
- Must report if found



# 2

## Biosecurity Risk Assessment

*What extra biosecurity control measures are required?*

- Avoid work in April–July
- All operators to be able to identify the nests and larvae of OPM
- If evidence of infestation is discovered the finding should be reported to the Forestry Commission via Tree Alert
- Works detailed in a Statutory Plant Health Notice such as removing and destroying eggs/nests/caterpillars

*Disposal of arisings/specific requirements:*

If arisings have to be removed, they should be transported in an enclosed container and taken to a licensed incineration site within the outbreak zone.

*Equipment in addition to standard issue:*

Disposable overalls and PPE, waste bags, biosecurity kit.

### Scenario 2: Removal of *Phytophthora ramorum*-infected sweet chestnut

#### Background

Scientists from Forest Research have confirmed that *Phytophthora ramorum* is the causal agent behind the death of several mature sweet chestnut trees along an avenue leading to a country house. As sweet chestnut is a sporulating host of this pathogen, a Statutory Plant Health Notice has been served which requires the felling and destruction of the material. *P. ramorum* is a highly transmittable pathogen.

Your company has been called in by the estate manager to fell and remove the trees. *P. ramorum* is a statutory controlled quarantine pest. This means that there are strict regulations on the transport of infected material and on biosecurity measures to reduce the chance of spread (as it can be transported in organic matter, soil and water on boots, clothing, equipment and vehicles). The arisings from the felled trees can only be moved under licence and can only be processed at a site which is licensed to handle *P. ramorum*-infected material.

#### Example risk assessment

*Is a pest and/or pathogen of concern present or suspected on or adjacent to the site?*

**Yes/No**

*How does this affect your work?*

- Statutory Plant Health Notice in place – high risk
- Specific biosecurity plan/method statement based on guidance

*What extra biosecurity control measures are required?*

- Vehicles and machinery will be kept on hard standing away from standing water, and ideally off the felling site, wherever possible.
- Any climbing or lowering equipment will be cleaned of any organic matter before leaving site. The equipment will be thoroughly washed according to manufacturer's instructions and fully dried before re-use.
- Before leaving site, all boots, outer wear, pruning saws, machinery and vehicles will be cleaned of soil and organic matter and disinfected.

*Disposal of arisings/specific requirements:*

All materials will be burnt on site. The Environment Agency will be consulted prior to destruction of material.

*Equipment in addition to standard issue:*

Portable pressure washer for vehicles and machinery, biosecurity kit(s) and disinfectant.



# Biosecurity Risk Assessment

# 2

## Scenario 3: Dead plane removal

### Background

As the main tree work contractor for the city council you have been called in to undertake the removal of a semi-mature London plane tree (*Platanus × hispanica*) which has significant dieback in the crown. The tree is roadside and deemed at risk of failure so the council has decided to remove it immediately on safety grounds. The council is unsure of the cause of the sudden death of the tree but suspects that the decline could be due to canker stain of plane (*Ceratocystis platani*), a pathogen that has killed thousands of plane trees in mainland Europe.

Canker stain of plane is a quarantine organism. A report should be made through the Forestry Commission's Tree Alert reporting tool, and advice from plant health authorities will be sought before commencing work. This pathogen can be transmitted from tree to tree on unsterilised tools, infected climbing equipment and on PPE. It can also be spread in infected sawdust, wood and bark. All arisings from infected trees are potentially infectious. Because of this, the council has instructed you to take a precautionary approach towards the biosecurity on this job and treat the tree as highly infectious.

### Example risk assessment

*Is a pest and/or pathogen of concern present or suspected on or adjacent to the site?* **Yes/No**

*How does this affect your work?*

- Treated as high risk
- Specific biosecurity plan/method statement based on guidance
- Extra time and resources required to meet job requirements

What extra biosecurity control measures are required?

- Tarpaulin or plastic sheeting should be placed around the work site to capture sawdust from the operations.
- All those on site to wear disposable coveralls during the operation.
- Handsaws should be used where possible to de-limb the tree with minimum production of sawdust. The tree should be felled with as few cuts as possible and the material should not be chipped.
- Handsaws, chainsaws, climbing equipment, machines, PPE and clothing should have all sawdust, woodchip and foliage removed before leaving site. Particular attention should be paid to the inside of chainsaws to ensure all sawdust is effectively removed. Removed material should be collected and bagged and incinerated with all other infected materials. All tools to be sterilised and climbing equipment to be washed and dried in accordance with manufacturer's instructions. Ropes used in the tree should be destroyed along with the arisings. All machines steam cleaned before leaving site.

*Disposal of arisings/specific requirements:*

All arisings, plastic sheets and coveralls to be sprayed with an approved disinfectant and transported in an enclosed container to a licensed waste-handling facility for immediate incineration. Vehicle and container to be steam cleaned before leaving the waste site.

*Equipment and training in addition to standard issue:*

Large plastic sheets, disposable overalls, waste bags, biosecurity kit and disinfectant, crane, enclosed tipper/lorry, spray equipment, training and control systems for disinfectant.



# 2

## Biosecurity Risk Assessment

### Scenario 4: Dying elm tree

#### Background

A local authority has identified a street elm tree (*Ulmus*) as infected with Dutch elm disease (*Ophiostoma ulmi* and *O. novo-ulmi*) and requires its removal and destruction. The local authority is currently surveying the area to identify any other hosts and will consider using The Dutch Elm Disease (Local Authorities) Order 1984 if required to prevent the spread of the disease. Dutch elm disease is one of the most serious tree diseases in the world. It has attacked over 60 million British elms in two epidemics and continues to spread today. It infects all of Britain's major elm species.

#### Example risk assessment

*Is a pest and/or pathogen of concern present or suspected on or adjacent to the site?*

**Yes/No**

*How does this affect your work?*

- If the tree has been dead some time it could be at risk of failure
- Disposal of arisings
- Extra time and resources required to meet disposal requirements

*What extra biosecurity control measures are required?*

- All boots, outer wear, pruning saws, machinery and vehicles will be cleaned of soil and organic matter and disinfected.

*Disposal of arisings/specific requirements:*

All wood/timber to be removed to the designated council-run site for disposal. Branches chipped through a woodchipper can be disposed of in the normal way.

*Equipment in addition to standard issue:*

None. However, a larger vehicle with a grab would be useful for moving larger sections of timber.



# Arboricultural Operations Pathway and Generic Biosecurity Risk Assessment

# 3

**Note:** The Biosecurity Risk Assessment Process in *Appendix 2* should identify if sites are 'higher risk' or if only 'preventative control measures' apply.

Pathway	Pathway elements	Pathway risk	Preventative control measures	Higher risk control measures in addition to preventative measures	Operational implementation requirements
<b>People – clothing/ personal protective equipment (PPE)</b>	<ul style="list-style-type: none"> <li>■ Soil</li> <li>■ Organic material (foliage/ sawdust)</li> <li>■ Water</li> </ul>	<p>Soil and organic matter on clothing and footwear can contain the propagules of pests and pathogens. This can inadvertently transport them from an affected area to an unaffected one.</p>	<p>Clean off any soil and organic matter between sites.</p> <p>Always arrive at a new site with clothing that is clean and free from soil and organic material.</p>	<p>Thoroughly remove all organic material and soil from clothing, PPE and helmets before leaving site.</p> <p>Avoid undertaking works during wet periods.</p> <p>Wash, disinfect and dry clothing and PPE before using on another site.</p>	<p>Extra sets/designated sets of clothing and PPE.</p> <p>Use disinfectant spray for waterproof clothing and footwear. Spray disinfectant until it runs off.</p> <p>Well-stocked and accessible biosecurity kits at each site/ in each vehicle.</p> <p>Control of substances: follow CoSHH risk assessments and make sure that disinfectant does not run off into waterways.</p> <p>Appropriate training for operators.</p>
<b>Footwear</b>	<ul style="list-style-type: none"> <li>■ Soil</li> <li>■ Organic material (foliage/ sawdust)</li> <li>■ Water</li> </ul>		<p>Thoroughly clean off all soil and organic matter from boots before leaving site.</p> <p>Always arrive at a new site with footwear that is clean and free from soil and organic material.</p>	<p>Thoroughly remove all organic material and soil from footwear before leaving site. Wash and disinfect boots before moving to a new site. Spray boots with disinfectant until it runs off.</p> <p>Avoid undertaking works during wet periods.</p>	



# 3

## Arboricultural Operations Pathway and Generic Biosecurity Risk Assessment

Pathway Vehicles and machinery	Pathway elements	Pathway risk	Preventative control measures	Higher risk control measures in addition to preventative measures	Operational implementation requirements
	<ul style="list-style-type: none"> <li>■ Soil</li> <li>■ Organic material (foliage/sawdust/chip)</li> <li>■ Water</li> </ul>	<p>Work vehicles and machinery travel from site to site and have the potential to carry infected material from one site to another.</p>	<p>Vehicles and machinery should be visibly free of soil and organic material upon arrival at a work site.</p> <p>Wherever possible park vehicles on hard standing and avoid muddy areas and areas of standing water.</p> <p>Clean regularly to prevent build-up of mud/soil on wheels and arches.</p>	<p>Avoid parking vehicles and machinery near to or downwind from operations that create sawdust.</p> <p>Remove all organic material and soil from the outside of the vehicle before leaving site including vehicle tyres, tracks, arches, truck bed and windscreens.</p> <p>Disinfect tyres before moving on to another site.</p> <p>Avoid driving or parking vehicles on muddy areas.</p> <p>Leave vehicles on hard standing.</p> <p>Avoid areas of standing water.</p> <p>Always plan to visit any known infected site last.</p> <p>Vehicles should be cleaned away from watercourses to avoid contaminants entering the water system.</p>	<p>Avoid taking vehicles and machinery on site unless absolutely necessary.</p> <p>Minimise transporting vehicles and machinery on and off site. If they can remain on site for multiple days this is preferred and reduces cleaning frequency.</p> <p>Well-stocked and accessible biosecurity kits at each site/ in each vehicle.</p> <p>Use a disinfectant on vehicles and machines.</p> <p>Control of substances: follow CoSHH risk assessments and make sure that disinfectant does not run off into waterways.</p> <p>Appropriate training for operators.</p>



# Arboricultural Operations Pathway and Generic Biosecurity Risk Assessment

# 3

Pathway	Pathway elements	Pathway risk	Preventative control measures	Higher risk control measures in addition to preventative measures	Operational implementation requirements
<b>Hired plant</b>	<ul style="list-style-type: none"> <li>■ Soil</li> <li>■ Organic material (foliage/sawdust/chip)</li> </ul>	<p>Hired machinery could be carrying mud/soil and plant material which could harbour any number of organisms from other areas to the site where you are working.</p>	<p>Ask the hire company to provide you with details of the location where the machinery has been previously used. If this area is known to have a pest or pathogen, appropriate biosecurity controls should be put in place to prevent its introduction.</p> <p>Ask the hire company to make sure the machinery is clean and free from debris upon delivery to site.</p> <p>Do not accept dirty machinery on site. Clean in, clean out.</p>	<p>See <b>Chippers, stump grinders, plant, etc.</b> below</p>	<p>Good relationship with hire company.</p> <p>Request information on ordering.</p> <p>Assess equipment before unloading. Be prepared to reject.</p>
	<p><b>Chippers, stump grinders, etc.</b></p> <ul style="list-style-type: none"> <li>■ Soil</li> <li>■ Organic material (foliage/sawdust/chip)</li> </ul>	<p>Chippers and stump grinders create a lot of woodchip and dust which can contain the propagules of pests and pathogens. If these machines are not regularly cleaned of debris they can transport infected material from one site to another.</p> <p>Debris generated by machinery can be directly spread around site.</p>	<p>Machines should be free of organic material prior to transport and arrival at a new site.</p> <p>Avoid driving or parking machines on muddy areas.</p> <p>Keep machines on hard standing. Avoid areas of standing water.</p>	<p>Clean machines to remove all soil and organic material before leaving site, paying particular attention to the feed, chipping components, blades, body, wheels and discharge chute.</p> <p>Thoroughly clean machines before using again. Cleaned chipper and stump grinder components should be disinfected before next use.</p> <p>Wash and disinfect tyres, tracks or trailer tyres before moving on to another site.</p> <p>Position chipper chute and stump grinder boards to avoid spreading material around site.</p>	<p>Designate time for maintenance and cleaning of machinery.</p> <p>Well-stocked and accessible biosecurity kits at each site/ in each vehicle.</p> <p>Control of substances: follow CoSHH risk assessments and make sure that disinfectant does not run off into waterways.</p> <p>Appropriate training for operators.</p>



# 3

## Arboricultural Operations Pathway and Generic Biosecurity Risk Assessment

Pathway	Pathway elements	Pathway risk	Preventative control measures	Higher risk control measures in addition to preventative measures	Operational implementation requirements
<p><b>Climbing and rigging equipment</b></p>	<p><b>Rope, strops, slings and cambium savers, etc.</b></p> <ul style="list-style-type: none"> <li>■ Soil</li> <li>■ Water</li> <li>■ Organic material (foliage/sawdust)</li> </ul>	<p>Rope can transport the spores of pathogens or pest insects and their eggs from one tree to another, and the friction from rope rubbing against bark can expose the cambium which can leave it open to infection.</p>	<p>Remove any organic material from climbing and rigging equipment before packing away.</p> <p>Where possible low friction devices such as cambium savers should be employed to reduce damage to the cambium.</p> <p>Rope should be regularly cleaned and dried as per instructions from the rope manufacturer.</p>	<p>If ropes are used on trees that are showing signs of infection they should not be re-used until they have been thoroughly cleaned, disinfected and dried as per instructions from the rope manufacturer.</p> <p>Metal equipment such as climbing spikes and karabiners should be washed and disinfected before being used again.</p> <p>Keep kit away from muddy areas.</p> <p>Any kit that gets covered in soil should be cleaned on site and washed and thoroughly dried before being used again.</p>	<p>Purchase suitable equipment from manufacturers that state disinfection instructions.</p> <p>Designate sets of equipment for infected sites.</p> <p>Designate time for maintenance and cleaning of equipment.</p> <p>Well-stocked and accessible biosecurity kits at each site/ in each vehicle.</p> <p>Control of substances: follow CoSHH risk assessments and make sure that disinfectant does not run off into waterways.</p> <p>Appropriate training for operators.</p>





# Arboricultural Operations Pathway and Generic Biosecurity Risk Assessment

# 3

Pathway	Pathway elements	Pathway risk	Preventative control measures	Higher risk control measures in addition to preventative measures	Operational implementation requirements
<p><b>Pruning and other equipment</b></p>	<p><b>Secateurs, handsaws, chainsaws, soil decompaction equipment and hand tools</b></p> <ul style="list-style-type: none"> <li>■ Soil</li> <li>■ Organic material (foliage/sawdust)</li> </ul>	<p>Arboricultural operations open the tree to infection and infected equipment can introduce pathogens directly to damaged areas.</p>	<p>Ask the hire company to Remove all organic material from equipment and disinfect blades/cutting surfaces, such as chainsaw bar and chain and blades of secateurs and handsaws, in between trees.</p> <p>Remove and disinfect soil decompaction equipment.</p> <p>Remove any organic material from pruning equipment before leaving the site.</p>		<p>Designate sets of equipment for infested sites.</p> <p>Designate time for maintenance and cleaning of equipment.</p> <p>Well-stocked and accessible biosecurity kits at each site/ in each vehicle.</p> <p>Use Propellar disinfectant on metal tools. Make sure tools are cool prior to disinfecting.</p> <p>Control of substances: follow CoSHH risk assessments and make sure that disinfectant does not run off into waterways.</p> <p>Appropriate training for operators.</p>
	<p><b>Sampling equipment: increment borers/resistograph drills</b></p> <ul style="list-style-type: none"> <li>■ Organic material (sawdust, wood)</li> </ul>	<p>Increment borers and drills create wounds in the stem of the tree and can introduce pathogens from one tree to another. Sampling tools are usually used on trees where some form of decay is suspected so they are high risk equipment.</p>	<p>All organic matter should be thoroughly cleaned off and the equipment disinfected between trees.</p>		



# 3

## Arboricultural Operations Pathway and Generic Biosecurity Risk Assessment

Pathway	Pathway elements	Pathway risk	Preventative control measures	Higher risk control measures in addition to preventative measures	Operational implementation requirements
Arboricultural arisings and waste	<ul style="list-style-type: none"> <li>Organic material (woodchip, stump grindings, sawdust, foliage)</li> </ul>	<p>Woodchip from infected/infested material is not always reduced to such a size that pests, pathogens or their propagules are destroyed. Tree pests and pathogens can be inadvertently spread long distances in organic material.</p>	<p>Avoid removing material unless required.</p> <p>Reduce the distance travelled to disposal as much as is practicable.</p> <p>Any material which is intended for mulching should be heat treated in order to kill any harmful pests.</p> <p>If you are sending arisings for re-use, implement biosecurity practices at waste facility, including for machinery.</p>	<p>Material known to be infected/infested with a damaging pest should be burnt or buried, preferably on site.</p> <p>Do not remove infected chipped material. Do not use the chip as mulch. If the material must be moved, transport it in an enclosed container and dispose of it at a licensed infectious-waste-handling facility.</p>	<p>There will often be specific guidance on appropriate management of infected material depending upon the pest or pathogen in question or the location of a site – organisations should be aware of such guidance which should be followed to avoid spreading the infection to new areas.</p> <p><i>Phytophthora</i>-infested materials can be composted under strictly controlled conditions.</p>
	<ul style="list-style-type: none"> <li>Timber, logs and associated soil</li> </ul>	<p>Certain tree pests and pathogens can survive on or within untreated wood and timber.</p> <p>If infected wood is transported from one location to another there is the possibility of satellite outbreaks occurring.</p>	<p>All timber and logs which are to be moved should be free of mud and vegetation prior to transport.</p> <p>Wood showing evidence of infestation or infection should be appropriately processed such as by incineration, kiln drying, debarking etc.</p>	<p>If the tree that the timber has come from is suspected of being contaminated with a quarantine pest or pathogen, it should not be transported without the appropriate movement licence.</p> <p>Certain tree pests may necessitate removal and destruction of bark, some may require specialist licensed heat treatment of the timber and some may require the complete destruction of the material through burning/burial.</p>	<p>There will often be specific guidance on appropriate management of infected material depending upon the pest or pathogen in question or the location of a site – organisations should be aware of such guidance which should be followed to avoid spreading it to new areas.</p>



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Pathway	Pathway elements	Pathway risk	Preventative control measures	Higher risk control measures in addition to preventative measures	Operational implementation requirements
<p><b>Live plants</b></p>	<p><b>Living plants of any size, including nursery stock and instant-impact trees</b></p> <ul style="list-style-type: none"> <li>■ Soil</li> <li>■ Water</li> <li>■ Organic material</li> </ul>	<p>The mature, juvenile or propagule stages of a pest or pathogen can be harboured in the foliage, woody material, the bark or the rootball of the planting stock and can in some instances lead to the initiation of an outbreak. Visual inspection of the plants will not always be adequate for identification of the presence of a pathogen or pest.</p>	<p>Plants should always be sourced from a reputable supplier.</p> <p>Be aware of the signs and life stages of the pests and pathogens that can affect the tree species you are planting.</p> <p>Certain imported tree species should have a plant passport which stipulates that the plant has been grown in an area that is free from quarantine pathogens or pests.</p> <p>Each plant's history should be traceable. Records of tree purchase, planting locations and monitoring should be retained.</p> <p>Those responsible for tree supply should ensure that trees and associated soil are supplied to customers free of pests and pathogens at all points in the supply chain. A system such as quarantining and monitoring imported plants may be appropriate.</p> <p>Inspect trees prior to planting, ideally upon delivery.</p> <p>Implement regular inspections of newly planted trees.</p>	<p>Regularly inspect instant-impact trees prior to and following planting. Regular monitoring will ensure that any potential pests and pathogens are discovered early.</p>	<p>Visit the nursery to see growing conditions of plants.</p> <p>Planting stock to be UK grown or nursed where possible.</p> <p>All stock sourced from outside the UK will have the appropriate plant passport or phytosanitary certificate and will have been monitored for pests and pathogens prior to planting out, and the consignment will have been notified to relevant authority.</p> <p>Records of planting material and planting location will be retained.</p> <p>Annual follow up checks will be undertaken on planted material for a minimum of two years by staff familiar with the symptoms and host species of priority pests and pathogens. Consider varying the season when inspection is carried out.</p>

## 4

## Example Biosecurity Policy

EXAMPLE  
COMPANY**Biosecurity Policy**

This policy is a statement of the intent of the directors and shall apply to all operations and work sites visited and managed by **EXAMPLE COMPANY**.

Biosecurity is defined as a set of precautions that aim to prevent the introduction and spread of harmful organisms. These may be pests, pathogens or invasive species.

- We are committed to planning and managing our business activities to ensure the possibility of introduction and spread of harmful organisms is kept to a minimum.
- We are committed to complying with all legal requirements applicable to plant health and biosecurity, for example the *Plant Health Act* and *Plant Health Order*.
- We are committed to ensuring amendments, alterations and additions to the legal requirements are incorporated into working practices.
- The necessary personnel and financial resources will be allocated to assist the company in meeting its biosecurity objectives.
- We are committed to developing and maintaining effective relationships with plant health agencies and complying with all plant health notices and requirements.
- We are committed to diversifying tree populations where our business activities allow, in order to mitigate possible future pest and pathogen introductions.
- The company shall ensure safe handling and disposal of all harmful organisms and all potentially contaminated materials.
- The company shall aim to ensure safe storage, handling and use of substances such as pesticides and disinfectants.
- We shall ensure all employees are competent to do their tasks, and will give them adequate training.
- Appropriate advice shall be sought from specialists if specific challenging biosecurity issues are identified before, during or after operations.
- We are committed to legal requirements for alerting the appropriate organisation of any suspected quarantine pest and pathogen outbreak we encounter.
- Our management system shall provide a framework for reviewing biosecurity objectives and targets.



## Example Biosecurity Policy

# 4

In order to meet these commitments, **EXAMPLE COMPANY** shall pursue the following objectives:

- The company will work to industry good practice and will ensure we are aware of any changes or updates to biosecurity practices.
- Work sites and staff will be appropriately supervised and monitored to ensure correct use of biosecurity control measures.
- The company will hold internal knowledge and information on basic identification of current pest and pathogen threats.
- The company shall be familiar with and utilise government guidance such as the *UK Plant Health Risk Register*.
- Prior to commencing work on site, a biosecurity risk assessment shall be completed to evaluate each site to identify appropriate biosecurity control measures, transport and disposal options.
- Staff will be issued with the necessary equipment, PPE and substances to implement biosecurity control measures, including effective hygiene and sanitation practices.
- Employees shall be briefed and trained on good biosecurity practices appropriate to their role within the organisation.
- Cases of ill health in trees will be reported through the Forestry Commission's Tree Pest and Pathogen sightings reporter (*TreeAlert*).
- Recommendations made to clients with regard to species choice for new tree planting will take into consideration the composition of the local tree population and the resilience of that population to pests, pathogens and invasive species.
- The species choice for new planting will take full account of local environmental conditions and ensure that *'the right tree is selected for the right place'*.
- Planting material will be appropriately sourced to minimise risk, ideally home grown, from reputable suppliers and assessed on delivery to the planting site to ensure it is in optimum physiological health and visually free from pests and pathogens.
- The planting of imported trees directly into the landscape will be avoided.
- This policy shall be displayed within the organisation at all times and shall be available to all interested parties.
- Individual biosecurity responsibilities are issued to each employee.
- This biosecurity policy shall be communicated to all persons working for or on behalf of the company.

The company will strive to raise the levels of biosecurity awareness throughout its workforce and to promote this awareness to its customers and suppliers.

**Signed:** .....

**Name:** .....

**Position in Company:** ..... **Date:** .....



# 5

## UK Plant Health Authorities Additional Information

Based on the cooperation of its partners, the UK Plant Health Service works with international bodies, other European and EU Member States and the European Commission to agree appropriate plant health rules and to coordinate their implementation. As set out in the Plant Health Act 1967, responsibility for plant health is split between the Forestry Commission, which has responsibility for the protection of forest trees and timber products in England and Scotland, and Defra and the devolved administrations, which have responsibility for the other aspects of plant health. APHA and the Plant Health Seed Inspectorate (PHSI) implement plant health regulations in England and Wales on behalf of Defra and the Welsh Government, with the Scottish Government responsible for implementation in Scotland.

Generally, **Defra** as the UK National Plant Protection Organisation (NPPO) leads on international plant health matters for the UK. Defra is the UK government department responsible for safeguarding our natural environment, supporting the food and farming industry, and sustaining a thriving rural economy. Defra's specific focus is England.

The **Scottish Plant Health Service** (SPHS), operating directly with the Scottish Government, oversees plant health policy responsibilities and plant and seed certification in Scotland and is supported by agencies such as the Scottish Agricultural Science Agency (SASA).

Plant health policies and regulation in Wales are set by the Welsh Government usually following practices set by Defra. These are implemented by **Natural Resources Wales** (NRW) and APHA. NRW was formed in 2013, combining the functions of the then Countryside Council for Wales, Forestry Commission Wales and the Environment Agency in Wales.

In Northern Ireland, the **Plant Health Division of the Department of Agriculture, Environment and Rural Affairs** (DAERA) has overall responsibility for plant protection and, like Wales, Northern Ireland usually works with and follows practices set by Defra.

Like Defra, SPHS is supported by a non-ministerial government department, the **Forestry Commission** (FC). The FC has three divisions: Scotland, England and Forest Research, with FC Scotland reporting to the Scottish parliament and FC England reporting to the Westminster parliament. The FC is responsible for the protection of forest trees and timber from invasive pests and diseases in England and Scotland only. **Natural Resources Wales** (NRW) is responsible for this throughout Wales. The FC is also involved with urban trees and their management. FC tree health officers undertake surveillance and inspect trees for pests and pathogens to monitor spread, horizon scan and confirm (or otherwise) the presence of pests and pathogens. They also inspect wood imports at points of entry around the country to minimise the risk from foreign pests and pathogens, and they coordinate control measures for quarantining pest and pathogen outbreaks. Where outbreaks do occur, FC experts work with local authorities and landowners to contain and control any spread.

The **Animal and Plant Health Agency** (APHA) is an agency of Defra and is part-sponsored by the Scottish and Welsh governments. APHA is the plant health authority responsible for identifying and controlling plant pests and diseases, and for undertaking surveillance for new and emerging pests and diseases both at UK borders and inland. The Plant Health and Seeds Inspectorate (PHSI) is part of APHA and implements and enforces plant health policy in England and Wales. Those that want to grow, import, export or move certain plants, trees or plant material will use the PHSI's services. The Scottish Government's Plant Health Service has similar responsibilities.

In the republic of Ireland similar services, information and the implementation of EU requirements are provided by the Department of Agriculture, Food and the Marine.



# UK Plant Health Authorities Additional Information

# 5

Policy and the political work of the UK Plant Health Service are underpinned by legislation. Relevant legislation includes:

- **EC Plant Health Directive 2000/29/EC:** EU rules on plant health aim to protect crops, fruits, vegetables, flowers, ornamentals and forests from harmful pests and diseases (harmful organisms) by preventing their introduction into the EU or their spread within the EU. This aim helps to contribute to sustainable agricultural and horticultural production through plant health protection; and contribute to the protection of public and private green spaces, forests and the natural landscape. EC Plant Health Directive 2000/29/EC aims to meet this by legislating general principles based upon provisions laid down in the International Plant Protection Convention (IPPC).
- **Plant Health Act 1967 (c.8):** prescribes the Forestry Commissioners as the competent authority in England and Scotland with regard to the protection of forestry trees and timber. Otherwise the competent authority is the Secretary of State for England, Scottish Ministers for Scotland, and Welsh Ministers for Wales.
- Orders are the principal instrument in the UK for implementing the plant requirements in the European Community in respect of forestry material, as set out in **EC Plant Health Directive 2000/29/EC** (Plant Health (England) Order 2005 (as amended), the Plant Health (Wales) Order 2006, the Plant Health (Scotland) Order 2005, the Plant Health (Northern Ireland) Order 2006 and the Plant Health (Forestry) Order 2005). The Plant Health Order prohibits the import of some genera and certain types of material from particular species and also imposes special restrictions and movement restrictions on a number of crop and tree species.

Supporting plant health information can be found at: [www.gov.uk/guidance/plant-health-controls](http://www.gov.uk/guidance/plant-health-controls).

Additionally, infected vegetation and trees are waste and will need to be disposed of in accordance with the relevant notice and possibly the environmental and pollution regulations such as:

- The Environmental Permitting Regulations (England & Wales) 2010
- The Pollution Prevention & Control (Scotland) Regulations 2000
- The Pollution Prevention & Control (Northern Ireland) Regulations 2003
- The Waste Management Licensing (Scotland) Regulations 2011
- The Waste Management Licensing (Northern Ireland) Regulations 2003

Currently much of this information is collated in the UK Plant Health Information Portal: [planthealthportal.defra.gov.uk/pests-and-diseases/pest-and-disease-alerts/](http://planthealthportal.defra.gov.uk/pests-and-diseases/pest-and-disease-alerts/)

For more information about importing trees from outside the EU:

[www.gov.uk/guidance/importing-plants-fruit-vegetables-or-plant-material-to-the-uk](http://www.gov.uk/guidance/importing-plants-fruit-vegetables-or-plant-material-to-the-uk)

For more information about importing trees from within EU:

[www.gov.uk/guidance/importing-trees-and-plants-to-england-and-wales-from-the-eu](http://www.gov.uk/guidance/importing-trees-and-plants-to-england-and-wales-from-the-eu)



# 6

## Biosecurity Training

There are many qualifications in many different areas of competence that allow operators, managers and professionals to improve their knowledge and skills base. CPD (continuing professional development) is beneficial to both the individual, who gains new skills, and the business or client, which also gains added value and demonstrates professionalism. Plant health and biosecurity are no different to any other areas of expertise in this regard.

As a minimum, tree professionals should be able to:

- understand why biosecurity is important;
- identify the symptoms of some of the most common and threat pests and pathogens;
- identify pathways for introduction and spread;
- understand when and how to undertake biosecurity measures effectively;
- know where to go to get more information on particular pests and pathogens; *and*
- know when to report suspected ill health in trees, to whom and what information to include.

In order to help organisations deliver biosecurity training to staff, Forestry Commission England and industry partners have produced a free-to-use biosecurity e-learning package which is aimed at those in the forestry, arboricultural and landscaping industries. Modules include biosecurity awareness, pathways, personal controls and biosecurity measures; they are available from: [www.forestryelearning.org.uk/login/index.php](http://www.forestryelearning.org.uk/login/index.php)

The GB Non-native Species Secretariat provides a free e-learning package that covers the subject of non-native invasive species in three concise modules. This course can be accessed at: [www.nonnativespecies.org/index.cfm?sectionid=123](http://www.nonnativespecies.org/index.cfm?sectionid=123)

Observatree, a tree health monitoring project, has a library of online training presentations and webinars covering many pests and pathogens, guidance on use of Tree Alert and how to evaluate the health of a tree. The Observatree project also provides additional pest and pathogen guidance. Find it here: [www.observatree.org.uk/resources/watch-and-learn/](http://www.observatree.org.uk/resources/watch-and-learn/)

Plant health professionals can now gain recognition by becoming members of The Plant Health Professional Register, operated by the Royal Society of Biology. Grades of Associate, Registered and Senior Plant Health Professional are awarded by assessment of an applicant's knowledge and application across: plant health regulations; roles and responsibilities in reporting plant health concerns; risk-based decision-making, contingency planning and outbreak management. Further information can be found at: [www.rsb.org.uk/careers-and-cpd/registers/plant-health-register](http://www.rsb.org.uk/careers-and-cpd/registers/plant-health-register)

### Staff updates and toolbox talks

It is important to recognise how quickly change can happen when dealing with pests and pathogens. The range of organisms can change quickly and with them the protected zones and restrictions in place. New organisms can arrive that have different host plants and different dispersal pathways. For this reason, it is important that regular staff updates or toolbox talks are held which summarise any key information or changes that may affect the way the organisation conducts its business. The devolved Plant Health Agencies regularly release tree health updates. These are useful mechanisms for keeping up-to-date with the latest pest and pathogens news. Examples include:

- Natural Resource Wales: [www.naturalresources.wales/guidance-and-advice/environmental-topics/woodland-management/tree-health-and-biosecurity/tree-health-in-wales/?lang=en](http://www.naturalresources.wales/guidance-and-advice/environmental-topics/woodland-management/tree-health-and-biosecurity/tree-health-in-wales/?lang=en)
- Forestry Commission England: [www.forestry.gov.uk/england-treehealthnews](http://www.forestry.gov.uk/england-treehealthnews)
- Forestry Commission Scotland: [scotland.forestry.gov.uk/supporting/forest-industries/tree-health](http://scotland.forestry.gov.uk/supporting/forest-industries/tree-health)
- Northern Ireland combines plant and tree health updates at: [www.daera-ni.gov.uk/articles/emerging-threats-plant-health](http://www.daera-ni.gov.uk/articles/emerging-threats-plant-health)

For blank toolbox talk templates and advice on how to deliver the completed version, visit the Arboricultural Association website: [www.trees.org.uk/Help-for-Arborists](http://www.trees.org.uk/Help-for-Arborists)





## Additional Resources and Links to Good Practice and Advice

# 7

Useful websites for up-to-date information on pests and pathogens.

- The **UK Plant Health Information Portal** is an online hub for plant health information, data and resources. It provides information about plant pests and pathogens, including the assessments of risk undertaken by government and the data underpinning those assessments, with links to other sites of interest, including non-government sites, as well as information on the plant health controls and services provided by government. Find out more here: [planthealthportal.defra.gov.uk](http://planthealthportal.defra.gov.uk)
- The UK Plant Health Risk Register can be found at: [secure.fera.defra.gov.uk/phiw/riskRegister/](http://secure.fera.defra.gov.uk/phiw/riskRegister/)
- The **Forestry Commission's** pest and pathogen page has a wealth of information which is regularly updated. You can also sign up for the regional tree health update which will regularly arrive in your email inbox with all the latest tree health news in your region here: [www.forestry.gov.uk/pestsanddiseases](http://www.forestry.gov.uk/pestsanddiseases)
- **Forest Research** has a number of resources available from pest and disease alerts and advisory notes to posters and symptoms guides and can be accessed from: [www.forestresearch.gov.uk/](http://www.forestresearch.gov.uk/)
- The **London Tree Officers Association** has a number of resources to assist in the identification and management of various pests and pathogens that affect urban trees. Information can be found here: [www.ltoa.org.uk/resources/pest-diseases/biosecurity](http://www.ltoa.org.uk/resources/pest-diseases/biosecurity)
- **Observatree** is a collaborative project between Forest Research, the Forestry Commission, APHA, Defra, Fera Science Ltd, the National Trust, Natural Resources Wales and the Woodland Trust. It is funded by the EU's Life programme, with the aim of helping to spot new pest and pathogen threats to UK trees. [www.observatree.org.uk](http://www.observatree.org.uk)
- **Defra** guidance on importing trees: [www.gov.uk/guidance/importing-trees-and-plants-to-england-and-wales-from-the-eu](http://www.gov.uk/guidance/importing-trees-and-plants-to-england-and-wales-from-the-eu)
- Sourcing pest-free plants good practice guide: [www.plantnetwork.org/wordpress/wp-content/uploads/12568/parksbiosecuritysmall.pdf](http://www.plantnetwork.org/wordpress/wp-content/uploads/12568/parksbiosecuritysmall.pdf)
- Nursery biosecurity practice: [www.botanicgardens.eu/downloads/nurseriesbiosecuritysmall.pdf](http://www.botanicgardens.eu/downloads/nurseriesbiosecuritysmall.pdf)
- **British Standards Institute** (2014). *British Standard 8545: Trees: from nursery to independence in the landscape – Recommendations*
- Barcham Trees Specification Manual: [www.barchampro.co.uk/specification-manual](http://www.barchampro.co.uk/specification-manual)
- Example information on import restrictions can be found here: [www.gov.uk/guidance/importing-trees-and-plants-to-england-and-wales-from-the-eu](http://www.gov.uk/guidance/importing-trees-and-plants-to-england-and-wales-from-the-eu)
- For more information on building resilience in forests, woodlands and urban tree populations in the face of climate change, please visit: [www.forestry.gov.uk/climatechangeengland](http://www.forestry.gov.uk/climatechangeengland)

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# Background to the Arboricultural Association

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Founded in 1964, the Arboricultural Association is the largest and longest established UK body and authority for the amenity tree care profession. It has a base of circa 2,500 members in government, commercial and educational employment at craft, technical, supervisory, managerial, tutor and consultancy level.



The Arboricultural Association is regarded by central government departments, the Royal Horticultural Society and local government as the focal point for good practice in arboriculture, for certification and regulation of the industry, for information, education and research. It is unique in the profession in that its body of knowledge extends across the full spectrum of arboricultural issues and it can represent and advise a wide range of members from small operators to large corporate bodies, local and central government.

The Association publishes a range of technical leaflets, guidance notes and other publications concerning arboriculture, the quarterly *ARB Magazine* and the quarterly *Arboricultural Journal*. In its function as voluntary regulator for the arboricultural industry, the Association produces an online directory of Registered Consultants and Approved Contractors, all of whom have reached standards of excellence in arboriculture. The Association offers training through a varied programme of topical workshops, seminars, an annual trade show (The ARB Show) and an annual Amenity Conference. Various grades of membership exist for professional arboriculturists, those in related disciplines and enthusiasts.

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